

O'ZBEKISTON RESPUBLIKASI OLIY VA
O'RTA MAXSUS TA'LIM VAZIRLIGI

BUXORO DAVLAT UNIVERSITETI

KIMYO – BIOLOGIYA FAKULTETI

Organik va fizkolloid kimyo kafedrası

5440400 – kimyo ta'lim yo'nalishi

ORGANIK KIMYO FANIDAN

KURS ISHI

Mavzu: NOMDOR REAKSIYALAR

Bajardi :

Nozima Azimova

Qabul qildi:

S.F.Abduraxmonov

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R E J A

Kirish

Asosiy qism

1. Uglevodorodlarga oid nomdor reaksiyalar
2. Elementoorganik birikmalar, uglevodorodlarning galogenli hosilalari va karbonil birikmalarga oid nomdor reaksiyalar
3. Karbon kislotalar va ularning hosilalari, azot saqlagan birikmalar hamda uglevodlarga oid nomdor reaksiyalar

Xulosa

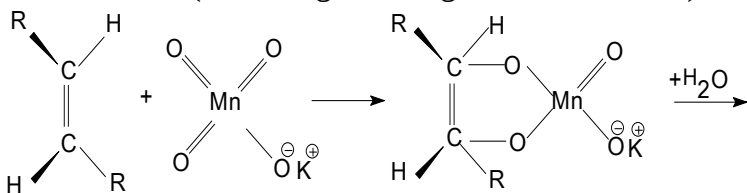
Foydalanilgan adabiyotlar

Kirish

Kimyoviy reaksiyalarning ularni ochgan kechish sharoitlarini batafsil o'rgangan olimlar nomi bilan atalishi shu kimyogarlarning mashaqqatli mehnatiga berilgan yuqori baho bo'lib, ularni nomini fanda abadiylashtiradi. Shu bois nomdori reaksiyalarni o'rganish o'quvchi, talaba va magistrning organik kimyoni chuqur o'rganishga, bu fan bo'yicha ilmiy-tadqiqotlar olib borishga undaydi. Oliy o'quv yurtlariga kiruvchi abituriyentlar uchun mo'ljallangan test topshiriqlarida, shuningdek organik kimyodan talabalar bilimlarini reyting tizimida nazorat qilish va baholashda ham nomdori reaksiyalarga oid savollar bor. Lekin organik kimyodagi reaksiyalarga bag'ishlab o'zbek tilida (ayniqsa lotin imlosida) yozilgan ilmiy uslubiy ishlar deyarli yo'q desa bo'ladi.

Shu bois keyingi yillarda o'zbek va rus tillarida nashr qilingan darslik, o'quv qo'llanma, monografiyalar va internetdan olingan ma'lumotlardan foydalanib, organik kimyoda olimlar nomi bilan yuritiladigan 190 ta nomdori reaksiyalar, ularni kechish sharoitlari to'g'risidagi ma'lumotlar umumlashtirilgan.

TR	Kashf qilgan olim(lar)	Reaksiyaning mohiyati
1	F.Bergius, 1925yil	Toshko'mir yoki qo'ng'ir ko'mirni 450-500 °C haroratda 30 MPa bosimda katalizator(Mo,Ni oksidlari yoki sulfidlari) ishtirokida vodorod bilan gidrogenlanganda alkan va sikloalkanlar aralashmasi hosil bo'ladi.[3-4]
2	Sabate va Sanderan, 1902yil	CO va CO ₂ 250-400°C haroratda Ni va Co katalizatori ishtirokida vodorod bilan reaksiyaga kirishganda metan hosil bo'ladi; $CO + 3H_2 = CH_4 + H_2O$ $CO + 3H_2 = CH_4 + H_2O$ $CO_2 + 4H_2 = CH_4 + 2H_2O$
3	F.Fisher va X. Tropsh, 1923yil	CO va H ₂ aralashmasidan Fe, Co katalizatori ishtirokida 200-300° C haroratda yuqori alkanlar hosil bo'ladi; $nCO + (2n+1)H_2 = C_nH_{2n+2} + H_2O$
4	A.Vyurs, 1855yil	Galogenalkanlar Na bilan ozon (K bilan yanada ozon) reaksiyaga kirishganda alkanlar hosil bo'ladi; $CH_3Br + 2Na + BrCH_3 = C_2H_6 + 2NaBr$ Agar reaksiyada 2 xil galogenalkan ishtirok etsa 3 xil alkan aralashmasi hosil bo'ladi; $3CH_3Br + 3C_2H_5Br + 6Na = C_2H_6 + 6NaBr + C_3H_8 + C_4H_{10}$;
5	Dyuma	Natriy atsetat ishqor bilan qizdirilganda metan hosil bo'ladi; $CH_3COONa + NaOH = CH_4 + Na_2CO_3$
6	Kol'be, 1849yil	To'yingan monokarbon kislotalar tuzlarini suvdagi eritmalarini elektroliz qilish orqali alkanlar olinadi; $R-COONa + 2H_2O = R-R + 2CO_2 + NaOH + H_2$;
7	Rid va Xorn, 1936yil	Alkanlar SO ₂ va Cl ₂ aralashmasi bilan UB nur ishtirokida reaksiyaga kirishib alkilsulfoxloridlarni hosil qiladi; $R-H + SO_2 + Cl_2 = R-SO_2Cl_2 + HCl$ Reaksiya S _R mexanizmda boradi; I. $Cl_2 = 2Cl^*$ $R-H + Cl^* = R^* + HCl$ II. $R^* + SO_2 = R-SO_2^*$ $R-SO_2^* + Cl_2 = R-SO_2Cl + Cl^*$ III. $2R^* = R-R$ $2Cl^* = Cl_2$ $R^* + Cl^* = R-Cl$; I.Zanjir o'sishining boshlanishi. II.Zanjirning o'sishi. III.Zanjirning uzulishi. Sulfoxlorlash reaksiyasida alkanlar molekulasidagi ikkilamchi vodorod atomlari sulfoxlorid (SO ₂ Cl) guruhiga eng oson birlamchi vodorod atomlari esa qiyinroq almashadi.Uchlamchi vodorodlar esa fazoviy to'siqlar sababli sulfoxlorid guruhiga almashinmaydi.
8	Ortner 1940yil	Alkanlar SO ₂ va O ₂ aralashmasi bilan UB nur ta'sirida reaksiyaga kirishganda alkan sulfooksidlar hosil bo'ladi (sulfooksidlash reaksiyasi); $2R-H + 2SO_2 + O_2 = 2R-SO_3H$ Bu reaksiya ham radikal mexanizmda boradi.UB nur ta'sirida alkanlardan radikal hosil bo'ladi so'ngra ular SO ₂ va O ₂ bilan reaksiyaga kirishadi; $R^* + SO_2 \rightarrow RSO_2^*$ $RSO_2^* + O_2 \rightarrow R-SO_4^*$ $R-SO_4^* + R-H \rightarrow RSO_4H + R^*$ (alkanperoksisulfokislota) $RSO_4H + 2 R-H \rightarrow RSO_3H + 2R^* + H_2O$
9	M.I.Konovalov,18	Alkanlar suyultirilgan (12.5%li) nitrat kislota bilan 110-140°C

	88-1894yillar	haroratda kavsharlangan nayda qizdirilganda nitroalkanlar hosil bo'ladi. $R-H+HNO_3 \rightleftharpoons R-NO_2+H_2O$
10	Rays, 1931yil	Alkanlar pirolizida C-C va C-H bog'lari gomolitik uzulib erkin radikal hosil bo'ladi. Propan pirolizida boradigan reaksiyalardan ayrimlarini keltiramiz. $CH_3-CH_2-CH_3 \rightarrow CH_3-CH_2^*+CH_3^*$ $CH_3-CH_2-CH_3+CH_3^* \rightarrow CH_3-CH_2-CH_2^*+CH_4$ $CH_3-CH_2^* \rightarrow CH_2=CH_2+CH_3-CH_3$ $2CH_3-CH_2-CH_2^* \rightarrow CH_3-CH_2-CH_3+CH_3-CH=CH_2$ $2CH_3-CH_2^* \rightarrow C_4H_{10}$ $CH_3-CH_2^*+CH_3-CH_2-CH_2^* \rightarrow C_5H_{12}$
11	M.Bertlo 1856yil	Uglerod sulfid va vodorod sulfid aralashmasini qizdirilgan mis ustidan o'tkazib, metan olinadi; $CS_2+2H_2S+8Cu \xrightarrow{qizdirish} CH_4+4Cu_2S$ Bu sintez tarixiy ahamiyatga ega!
12	Gofman	Tetraalkil ammoniy gidrooksidi 150° C gacha qizdirilganda uchlamchi amin, suv va alken hosil bo'ladi;[3,4,5] $[CH_3N^+-CH_2=CH-CH_3OH] \rightarrow CH_3N^++CH_2=CH-CH_3+H_2O$
13	O.Roelen, 1938yil	Alkenlar kobaltli katalizatorlar ishtirokida va bosim ostida CO va H ₂ bilan reaksiyaga kirishib monokarbonil birikmalarni hosil qiladi; $CH_2=CH_2+CO+H_2 \xrightarrow{katT, 90-150C, 10-30mPa} CH_3-CH_2CHO$ Bu reaksiya alkenlarni- gidroformillash(oksosintez)ga misoldir;
14	Braun, 1957yil	Alkenlar xona haroratida diboran bilan reaksiyaga kirishib alkilboranlarni hosil qiladi.Bu gidroborlash reaksiyalari oddiy va qulay bo'lib yuqori unum bilan amalga oshadi. Diboran BH ₃ ning dimeridir; $2BH_3 \leftrightarrow (BH_3)_2$ $(BH_3)_2+R-CH=CH_2 \rightarrow R-CH_2CH_2BH_2+R-CH-CH_2$ $(R-CH_2CH_2)_2BH+R-CH=CH_2 \rightarrow (R-CH_2CH_2)_3B$ Gidroborlash-oksidlash reaksiyasi orqali birlamchi spirt olinadi. $(R-CH_2-CH_2)_3B+3H_2O_2 \xrightarrow{OH^-} 3R-CH_2-CH_2-OH +B(OH)_3$
15	E.E.Vagner, 1888yil	Alkenlar ishqoriy muhitda kaliy permanganatning suyultirilgan eritmasi bilan oksidlanganda 1,2-diollar (glikollar) hosil bo'ladi; $R-CH=CH-R + KMnO_4 + 4H_2O \longrightarrow \begin{array}{c} OH \quad OH \\ \quad \\ R-CH-CH-R \end{array} +$ $+ KOH + 2MnO_2 \downarrow$ Bu reaksiya C=C bogini aniqlashda sifat reaksiya bo'lib , stereoselektiv (2ta OH ⁻ guruhining sis-birikishi bilan) kechadi. 

		$ \begin{array}{c} \text{R} \quad \text{H} \\ \diagdown \quad \diagup \\ \text{C} \quad \text{OH} \\ \parallel \\ \text{C} \quad \text{OH} \\ \diagup \quad \diagdown \\ \text{H} \quad \text{R} \end{array} + \text{H}_2\text{O} \longrightarrow \begin{array}{c} \text{HO} \quad \text{O} \\ \diagdown \quad \parallel \\ \text{Mn} \\ \diagup \quad \diagdown \\ \text{HO} \quad \text{O}^- \text{K}^+ \end{array} + \begin{array}{c} \text{HO} \quad \text{O} \\ \diagdown \quad \parallel \\ \text{Mn} \\ \diagup \quad \diagdown \\ \text{HO} \quad \text{O}^- \text{K}^+ \end{array} \longrightarrow \text{K}_2\text{MnO}_4 + \text{MnO}_2 + 2\text{H}_2\text{O} $
16	N.A.Prilijev, 1909yil	Alkenlar peroksibenzoy kislota va boshqa peroksi kislotalar bilan oksidlanganda epoksidlarni hosil qiladi; $ \text{R}-\text{CH}=\text{CH}-\text{R} + \text{C}_6\text{H}_5-\text{C}(=\text{O})\text{O}-\text{OH} \longrightarrow \text{R}-\text{CH}(\text{O})-\text{CH}-\text{R} + \text{C}_6\text{H}_5-\text{C}(=\text{O})\text{OH} $ peroksibenzoy kislota epoksid $ \text{CH}_3-\text{CH}=\text{CH}_2 + m\text{ClC}_6\text{H}_4-\text{C}(=\text{O})\text{O}-\text{OH} \xrightarrow[25^\circ\text{C}]{\text{CH}_2\text{Cl}_2} \text{CH}_3-\text{CH}(\text{O})-\text{CH}_2 + m\text{ClC}_6\text{H}_4-\text{C}(=\text{O})\text{OH} $ propilen m-xlor peroksibenzoy kislota propilen oksid m-xlorbenzoy kislota $ \begin{array}{c} \text{CH}_3 \\ \diagdown \\ \text{C}=\text{C} \\ \diagup \\ \text{H} \end{array} + \begin{array}{c} \text{O} \\ \parallel \\ \text{C}_6\text{H}_4 \\ \parallel \\ \text{O} \end{array} \xrightarrow[40^\circ\text{C}]{\text{izo C}_3\text{H}_7\text{OH}, \text{H}_2\text{O}} \begin{array}{c} \text{CH}_3 \\ \diagdown \\ \text{C}-\text{C} \\ \diagup \quad \diagdown \\ \text{H} \quad \text{O} \end{array} + \begin{array}{c} \text{O} \\ \parallel \\ \text{C}_6\text{H}_4 \\ \parallel \\ \text{O} \end{array} $ 2-metil 3-buten trimetiloksiran
17	M.A.Butlerov	Izobutilen sulfat kislota ta'sirida dimerlanish, trimerlanish va oligomerlanish reaksiyalariga oson kirishadi; $ (\text{CH}_3)_2\text{C}=\text{CH}_2 \xrightarrow{H_2SO_4, 80^\circ\text{C}} (\text{CH}_3)_3\text{C}-\text{CH}_2-(\text{CH}_3)\text{C}=\text{CH}_2 $ (80%) + $(\text{CH}_3)_3\text{CCH}=\text{C}(\text{CH}_3)_2 \xrightarrow{H_2Ni} (\text{CH}_3)_3-\text{CH}_2-\text{CH}(\text{CH}_3)_2$ (20%)
18	M.D.L'vov	500-600 °C da alkenlar galogenlar bilan o'rin olish reaksiyasiga kirishadi; $ \text{CH}_2=\text{CH}-\text{CH}_3 + \text{Cl}_2 \xrightarrow{500-600^\circ\text{C}} \text{CH}_2=\text{CH}-\text{CH}_2\text{Cl} + \text{HCl} $ (82% unum)
19	Vol-Sigler	Alkenlarga N-bromamid ta'sir ettirilganda qo'sh boqqa nisbatan α -holatdagi vodorod o'rin olish reaksiyasiga kirishadi .Reaksiyaga kiritiladigan N-bromatsetamid va N-bromruhimid toza bo'lishi shart. $ \text{CH}_2=\text{CH}-\text{CH}_3 \xrightarrow{\text{BrNHCOR}^*} \text{CH}_2=\text{CH}-\text{CH}_2\text{Br} $
20	N.D.Zelinskiy, 1934yil	Sikligneksenni 650 ° C haroratgacha qizdirilgan naydan o'tkazib , suvga o'tkazilganda butadien-1,3 va etilen hosil bo'ladi. $ \text{Cyclohexane} \longrightarrow \text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2 + \text{CH}_2=\text{CH}_2 $
21	Dil's-Alder, 1928yil	1,3-Alkadienlarga alkenlarning 1,4-birikishidan halqali birikmalar sintez qilindi; $ \text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2 + \text{CH}_2=\text{CH}_2 \longrightarrow \text{Cyclohexene} $
22	Krige 1936yil	Hozirgi kunda alkenlarni gidroksillashda osmiy(VIII) oksidi

		OsO₄ qo'shiladi. Bu reaksiyada erituvchi sifatida efir benzol siklogeksan yoki xloroformni ishlatish mumkin. $\text{CH}_3\text{-CH=CH-CH}_3 \xrightarrow{\text{OsO}_4, 25^\circ\text{C}, \text{NaHSO}_4 / \text{H}_2\text{O}} \text{CH}_3\text{-CHOH-CHOH-CH}_3 + (\text{HO})_2\text{OsO}_2$ Reaksiyaning I bosqichida OsO₄ alkenga birikib halqali efirni hosil qiladi .Bu efirga qaytaruvchi (Zn kukuni ,NaHSO₃ yoki NaHSO₃+H₂O) bilan ishlov berilganda Os-O bog'i oson uzilib 2,3-diol hosil bo'ladi;
23	Baker	Alkenlarni palladiy tuzlari katalizatorligida oksidlab karbonil birikmalar olinadi; $\text{CH}_2=\text{CH}_2 + 0.5\text{O}_2 \xrightarrow{\text{PdCl}_2, \text{H}_2\text{O}(\text{Cu}_2\text{Cl}_2)} \text{CH}_3\text{CHO}$ Etilen atsetaldegid $\text{CH}_3\text{-CH=CH}_2 + 0.5\text{O}_2 \xrightarrow{\text{PdCl}_2, \text{H}_2\text{O}(\text{Cu}_2\text{Cl}_2)} \text{CH}_3\text{-CO-CH}_3$ Propen atseton
24	Braun	Alkenlarni natriyborgidrid bilan toza platina katalizatorligida etanolda qaytarganda alkanlar hosil bo'ladi; $\text{CH}_2=\text{CH}_2 \xrightarrow{\text{NaBH}_4, 25^\circ\text{C}, [\text{Pt}](\text{etan ol})} \text{CH}_3\text{-CH}_3$
25	Meerveyn	To'yinmadan birikmalarni arildiazoniy tuzlari ta'sirida arillash Meerveyn reaksiyasi deyiladi; $\text{RCH=CHR}^I + \text{ArN}_2\text{X} \xrightarrow{\text{CuCl}_2} \text{ArRCH-CHR}^I\text{X yoki}$ $\text{XRCH-CHR}^I\text{Ar} \xrightarrow{-2\text{H}} \text{ArRC=CHR}^I \text{ yoki } \text{RCH=R}^I\text{Ar}$ Galogenarillash reaksiyalari mis(II) tuzlari ishtirokida amalga oshadi.
26	K.V.Sigler	Alkenlarga katalizator (trialkilyuminiy) ishtirokida bosim ostida alyuminiy va vodorod ta'sir ettirilganda alyuminiyorganik birikmalar hosil bo'ladi.Bu reaksiya gidroalyuminlash deb ham yuritiladi.[5,6] $3(\text{R}_2\text{C=CH}_2) \xrightarrow{\text{Al}, \text{H}_2, \text{bosim}(\text{AlR}^I_3)} (\text{R}_2\text{CH-CH}_2)_3\text{Al}$
27	Prev	Alkenlarni karbon kislotalarning kumushli tuzlari bilan galogenlar aralashmasi katalizatorligida trans-gidroksillaganda diollar hosil bo'ladi; $\text{CH}_2=\text{CH}_2 \xrightarrow{1.(\text{RCOOAg}+\text{X}_2)2.\text{H}_2\text{O}} \text{CH}_2\text{OH-CH}_2\text{OH}$
28	Sergeev	Alkinlar allil holatini gidroperoksidlash havo kislarodi va quyosh nuri ishtirokida boradi; $\text{RCH=CH-CH}_3 \xrightarrow{\text{O}_2, h\nu} \text{RCHOOH-CH=CH}_2$
29	Ryolen	Alkenlarni katalitik gidroformillash quyidagicha boradi; $\text{CH}_2=\text{CH}_2 \xrightarrow{\text{CO}, \text{H}_2, t^\circ, 10-20\text{mPa}, \{\text{Co}(\text{CO})_4\}} \text{CH}_3\text{CH}_2\text{-CHO}$ $2\text{PhCH=CH}_2 \xrightarrow{\text{CO}, \text{H}_2, t^\circ, \{\text{Co}(\text{CO})_4\}} \text{PhCH}_2\text{-CH}_2\text{CHO} + \text{PhCH(CHO)-CH}_3$
30	Lesli-Burjel	Galogenalkenlarni kislotali muhitda natriyamida bilan 100-160 °C gacha qizdirib degidrobromlash reaksiyasi asosida alkinlar olinadi; $\begin{array}{ccc} \text{RC=CH}_2 & \xrightarrow[2\text{H}^+, 100-160^\circ\text{C}]{1.\text{NaNH}} & \text{CH}\equiv\text{CH} \\ & (\text{ligroin}) & \\ \text{Br} & & \end{array}$
31	Frig-Buttenberg-Buxell	Kuchli ishqoriy muhitda diarilgalogenalkenlardan diarilatsetilenlar olish quyidagicha kechadi;

		$\begin{array}{c} \text{Ar} \quad \quad \text{X} \\ \diagdown \quad \diagup \\ \text{C} = \text{C} \\ \diagup \quad \diagdown \\ \text{Ar} \quad \quad \text{H} \end{array} \xrightarrow[\text{(efir)}]{\text{RLi}} \text{Ar} - \text{C} \equiv \text{C} - \text{Ar}$
32	Smidt	Alkenlarni palladiy xloridi ta'sirida suvli eritmada oksidlaganda metilketonlar hosil bo'ladi; $\begin{array}{c} \text{R} - \text{C} = \text{CH} \\ \quad \\ \text{H} \quad \text{H} \end{array} \xrightarrow[\text{suv}]{\text{PdCl}_2} \begin{array}{c} \text{R} - \text{C} - \text{CH} \\ \quad \\ \text{O} \quad \text{H} \end{array}$
33	Lem'yo-Jonson	Olefinlarni oldin OsO₄, so'ngra NaJO₄ bilan oksidlab parchalanganda ikkita kislorodli birikma hosil bo'ladi; [7] $- \text{CH} = \text{C} \begin{array}{l} \diagup \\ \diagdown \end{array} \xrightarrow{1.\text{OsO}_4, 2.\text{NaJO}_4} - \text{CHO} + \begin{array}{c} \diagup \\ \diagdown \end{array} \text{C} = \text{O}$
34	Lem'yo	Alkenlarni KMnO₄+NaJO₄;K₂CO₃ bilan oksidlaganda karbon kislota va keton aralashmasi hosil bo'ladi. [7-8] $\begin{array}{c} \text{RCH} = \text{C} - \text{R} \\ \\ \text{R} \end{array} \xrightarrow{\text{KMnO}_4 + \text{NaJO}_4 + \text{K}_2\text{CO}_3} \text{RCOOH} + \text{R}_2\text{CO}$
35	Gofman -Zand	Olefinlarni simob tuzlari bilan ishqorning suvdagi eritmasida oksimerkuriylash (оксимеркурирование) Gofman -Zand reaksiyasi deb yuritiladi; $\text{RCH} = \text{CH}_2 \xrightarrow[\text{suv}]{\text{HgZ}, \text{NaOH}} \begin{array}{c} \text{RCH} - \text{C} - \text{H} \\ \quad \\ \text{OH} \quad \text{HgZ} \end{array}$ $\text{Z} = \text{X}, -\text{NO}_3, -\text{OCOOCH}_3$
36	Bott	Sul'fat kislota va bortriflorid ta'sirida 1,1-dixloretilenga karboniy ionlarini biriktirib so'ngra gidroliz qilinsa, almashingan sirka kislotalar hosil bo'ladi; $\begin{array}{c} \text{H} - \text{C} = \text{C} - \text{Cl} \\ \quad \\ \text{H} \quad \text{Cl} \end{array} + \begin{array}{c} \\ - \text{C}^+ \\ \end{array} \xrightarrow{80-100\% \text{H}_2\text{SO}_4} \begin{array}{c} \quad \text{H} \\ - \text{C} - \text{C} - \text{C}^+ - \text{Cl} \\ \quad \quad \\ \text{H} \quad \text{H} \quad \text{Cl} \end{array} \xrightarrow{\text{suv}} \begin{array}{c} \quad \text{H} \\ - \text{C} - \text{C} - \text{C} = \text{O} \\ \quad \quad \\ \text{H} \quad \text{H} \quad \text{OH} \end{array}$
37	Prins	Alkenlarga kislotali katalizatorlar ishtirokida formaldegidning birikishi natijasida 1,3-glikollar va 1,3-dioksanlar hosil bo'ladi; [5,6,7] $\begin{array}{c} \diagup \quad \text{H} \\ \text{C} = \text{C} \\ \quad \\ \text{H} \quad \text{H} \end{array} + \text{H} - \text{C} = \text{O} \xrightarrow[\text{suv}]{\text{H}^+} \begin{array}{c} \diagup \quad \text{H} \quad \text{H} \\ \text{C} - \text{C} - \text{C} - \text{OH} \\ \quad \quad \\ \text{H} \quad \text{H} \quad \text{H} \end{array}$
38	F.Vyoler, 1862yil	Kalsiy karbidiga suv ta'sir ettirib atsetilenni sintez qildi; $\text{CaC}_2 + \text{H}_2\text{O} = \text{C}_2\text{H}_2 + \text{Ca(OH)}_2$

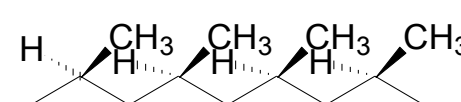
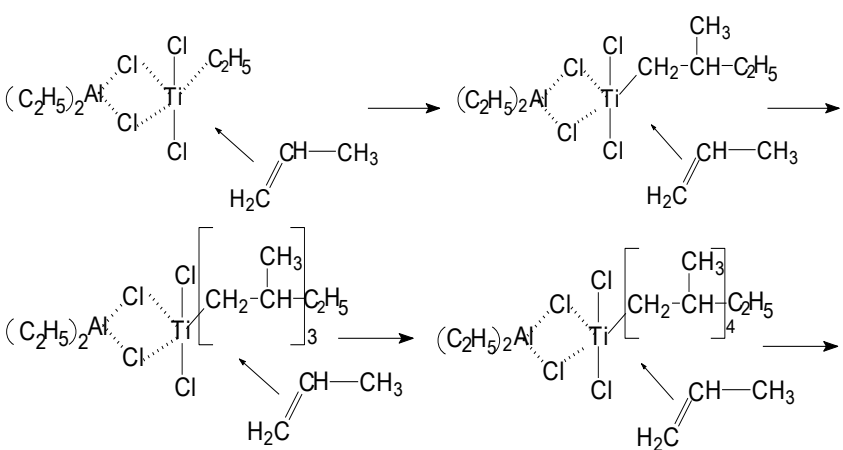
39	G.Devi 1831 yil	Kaliy karbidga suv ta'sir ettirib birinchi marta atsetilen oldi; $KC_2 + H_2O = C_2H_2 + KOH$
40	M.G.Kucherov, 1881yil	Alkinlar simob(II) tuzlari(masalan $HgSO_4$) ishtirokida sul'fat kislotaning suyultirilgan eritmasida gidratlanadi. Birinchi bosqichda uglerod-uglerod uchbog'iga suv molekulasining nukleofil hujumi natijasida oraliq beqaror enollar hosil bo'ladi, Ular barqaror karbonil birikmalarga qayta guruhlanadi; $CH \equiv CH + H_2O \xrightarrow{HgSO_4 + H_2SO_4} \left[H_2C = HC - OH \right] \longrightarrow CH_3 - C \begin{matrix} O \\ \parallel \\ H \end{matrix}$ vinil spirt
41	A.P.El'tekov, 1887yil	Alkinlarning gidratlanishida dastlab beqaror enollar hosil bo'lishi,so'ngra ular tegishli aldegid yoki ketonlarda qayta guruhlanishi A.P.El'tekov qaytaguruhlanishi deb yuritiladi; $\left[H_2C = HC - OH \right] \xrightarrow{H^+} CH_3 - C \begin{matrix} O \\ \parallel \\ H \end{matrix}$ vinil spirt
42	A.E.Favorskiy-M.F.Shostakovskiy-V.Reppe	Atsetilen va 1-alkinlar KOH katalizatorligida spirtlarni biriktirib,oddiy alkenil efirlarni hosil qiladi; $CH \equiv CH + HO - R \xrightarrow{KOH} \left[H_2C = C - O - R \right]$
43	A.E.Favorskiy, 1900yil	Atsetilen o'yuvchi kaliy va boshqa katalizatorlar ishtirokida bosim ostida efir eritmasida aldegid va ketonlar bilan reaksiyaga kirishib alkinol yoki alkindiollarni hosil qiladi;[6-9] $\begin{array}{c} R \\ \diagup \\ C=O \\ \diagdown \\ R \end{array} \xrightarrow{CH \equiv CH} \begin{array}{c} CH_3 \\ \\ R - C - C \equiv CH \\ \\ OH \end{array} + \begin{array}{c} R \\ \diagup \\ C=O \\ \diagdown \\ R \end{array} \longrightarrow$ $\longrightarrow \begin{array}{c} R & R \\ & \\ R - C - C \equiv C - C - R \\ & \\ OH & OH \end{array}$ Shu reaksiya asosida sanoatda atsetilen va atsetondan 2-etil-butin3-ol-2 olinadi; $H_3C - C \begin{matrix} O \\ \parallel \end{matrix} - CH_3 + CH \equiv CH \xrightarrow{KOH} \begin{array}{c} CH_3 \\ \\ H_3C - C - C \equiv CH \\ \\ OH \end{array}$
44	V.Reppe, 1925-1945 yillar	Metallarning karbonillari katalizatorligida atsetilen uglerod oksid va harakatchan vodorodi bor birikmalar (masalan suv,spirt, ammiak, birlamchi va ikkilamchi aminlar) bilan reaksiyaga kirishganda akril kislota va uning hosilalari hosil bo'ladi;

		$\text{CH}\equiv\text{CH} \xrightarrow{\text{Ni(CO)}_4} \begin{cases} \text{CO} + \text{H}_2\text{O} \rightarrow \text{H}_2\text{C}=\text{HC}-\text{COOH} \\ \text{CO} + \text{NH}_3 \rightarrow \text{H}_2\text{C}=\text{HC}-\text{CONH}_2 \\ \text{CO} + \text{ROH} \rightarrow \text{H}_2\text{C}=\text{HC}-\text{COOR} \\ \text{CO} + \text{NHR}_2 \rightarrow \text{H}_2\text{C}=\text{HC}-\text{CONR}_2 \end{cases}$ Bu oksodintez(karbinollash) reaksiyasining mexanizmi quyidagicha boradi. Katalizator(nikel tetrakarbon) π-kompleks hosil qilib uchbog'ni faollashtiradi; $\text{CH}\equiv\text{CH} + \text{Ni(CO)}_4 \longrightarrow \text{H}-\overset{\oplus}{\text{C}}\equiv\overset{\ominus}{\text{C}}-\text{H} + \text{CO}$ Ni(CO)_3 So'ngra CO ning π-kompleksiga birikishidan oraliq mahsulot (siklopropenon) hosil bo'ladi. Siklopropenon esa reaksiya muhitidagi suv, spirt, ammiak bilan reaksiyaga kirishib oxirgi mahsulotni hosil qiladi; $\text{O}=\text{C}^\oplus + \text{H}-\overset{\oplus}{\text{C}}\equiv\overset{\ominus}{\text{C}}-\text{H} \longrightarrow \text{O}=\text{C} \begin{array}{c} \text{C-H} \\ \diagup \quad \diagdown \\ \text{C} \end{array} \xrightarrow[\text{-Ni(CO)}_3]{\text{H-X}} \text{H}_2\text{C}=\text{HC}-\text{C} \begin{array}{c} \text{O} \\ \diagup \quad \diagdown \\ \text{X} \end{array}$ Ni(CO)_3 siklopropenon $\text{X} = -\text{OH}, -\text{OR}, -\text{NH}_2, -\text{NR}_2$;
45	Nyulend	Cu_2Cl_2 va NH_4Cl ning xlorid kislotadagi eritmalaridan atsetilen o'tkazilganda vinilatsetilen hosil bo'ladi. Atsetilen dimerlanadi; [6,7] $2 \text{CH}\equiv\text{CH} \xrightarrow{80^\circ\text{C}} \text{HC}\equiv\text{C}-\text{CH}=\text{CH}_2$
46	V.Reppe, 1949yil	Nikel atsetilenidni yoki nikel sianidning ammiakdagi eritmasi ishtirokida atsetilenning tetramerlanishidan 1,3,5,7-siklooktatetraen, pentamerlanishidan esa siklodekapentaen hosil bo'ladi; $\text{CH}\equiv\text{CH} \xrightarrow[1.96 \text{ MPa}, 80-120^\circ\text{C}]{\text{Ni(CN)}_2, \text{TGF}} \text{Cyclooctatetraene}$ Benzol va yuqori siklooligomerlar. $5 \text{CH}\equiv\text{CH} \xrightarrow[\text{bosim}, \Delta]{\text{Ni(CN)}_2, \text{TGF}} \text{Cyclodecapentaene}$
47	Shiffer, 1966yil	Dimetil atsetilen AlCl_3 ishtirokida benzolga trimerlanib, geksametil-bisiklo-[2,2,0]geksadien (Dyuar benzoli)ni hosil qiladi. U esa qizdirilganda geksametilbenzolga izomerlanadi; $3 \text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_3 \xrightarrow[\text{benzol}]{\text{AlCl}_3}$

48	A.E.Favorskiy, 1896yil	Atsetilenning monoalmashingan gomologlari kaliy gidroksidning spirdagi eritmasi bilan qizdirilganda dialmashingan izomerlarni hosil qiladi. Natriy metali bilan qizdirilganda teskri reaksiya borodi. Masalan; $\text{H}_3\text{C}-\text{H}_2\text{C}-\text{C}\equiv\text{CH} \xrightleftharpoons[\text{Na}, \Delta]{\text{KOH (spirt)}, 170^\circ\text{C}} \text{H}_3\text{C}-\text{C}\equiv\text{C}-\text{CH}_3$ butin-1 butin-2
49	A.E.Favorskiy, 1906 yil	Katalizator (KOH) ishtirokida atsetilan va atsetondan izopren olinadi; $\text{HC}\equiv\text{CH} + \text{KOH} \rightleftharpoons \text{HC}\equiv\text{C}^-\text{K}^+ + \text{H}_2\text{O}$ $\text{HC}\equiv\text{C}^-\text{K}^+ + \text{H}_3\text{C}-\text{C}(=\text{O})-\text{CH}_3 \longrightarrow \text{HC}\equiv\text{C}-\text{C}(\text{CH}_3)_2-\text{OK} \xrightarrow{\text{H}_2\text{O}}$ $\xrightarrow{\text{H}_2\text{O}} \text{HC}\equiv\text{C}-\text{C}(\text{CH}_3)_2-\text{OH} \xrightarrow{\text{H}_2} \text{H}_2\text{C}=\text{HC}-\text{C}(\text{CH}_3)_2-\text{OH} \longrightarrow$ $\xrightarrow{-\text{H}_2\text{O}} \text{H}_2\text{C}=\text{HC}-\text{C}(\text{CH}_3)=\text{CH}_2$
50	A.E.Favorskiy	Karbonil birikmalarni kuchli asoslar ta'sirida ,alkinlar bilan etinillash Favorskiy reaksiyasi deb yuritiladi;[6-8] $>\text{C}=\text{O} + \text{R}-\text{C}\equiv\text{CH} \xrightarrow[\text{efir}]{\text{KOH}, 0-5^\circ\text{C}} >\text{C}(\text{OH})-\text{C}\equiv\text{CR}$ * =NaNH₂
51	A.E. Chichibabin	Atsetilen bilan vodorod sul'fid 400-450⁰C haroratgacha qizdirilgan AlCl₃ ustidan o'tkazilganda tiofen hosil bo'ladi; $\begin{array}{c} \text{CH} \quad \text{CH} \\ \quad \\ \text{CH} + \text{CH} \end{array} \xrightarrow{\text{H}_2\text{S}} \text{C}_4\text{H}_2\text{S} + \text{H}_2$
52	Glazer 1870 yil	Alkinlar Cu₂Cl₂ bilan ammiak muhitida reaksiyaga kirishib misalkilatsetilenidni hosil qiladi. Uni havo kislorodi bilan oksidlab 1,3-diinlarni olish mumkun. $2\text{R}-\text{C}\equiv\text{CH} + \text{Cu}_2\text{Cl}_2 \xrightarrow[\text{spirt}]{\text{NH}_3} 2\text{R}-\text{C}\equiv\text{C}-\text{Cu} \longrightarrow$ $\xrightarrow[\text{spirt}]{\text{O}_2} \text{R}-\text{C}\equiv\text{C}-\text{C}\equiv\text{C}-\text{R}$

53	Shtraus	Monoalmashingan atsetilenlarning dimerlanish reakdiyasi mis xloridi va havo kislarodi ta'sirida boradi Reaksiya natijasida vinilatsetilenidlar hosil bo'ladi; $2RC\equiv CH \xrightarrow[\text{CH}_3\text{COOH}]{\text{Cu}_2\text{Cl}_2, \text{O}_2, \Delta} RC\equiv C-CH=C(R)-H$
54	Reppe	Atsetilen va formal'degiddan quyidagi sxema asosida 1,3-butadien olinadi; $HC\equiv CH + CH_2O \longrightarrow OHCH_2-C\equiv C-CH_2OH$ $HO-H_2C-CH_2-CH_2-CH_2-OH \xrightarrow[\text{NaH}_2\text{PO}_4]{280^\circ\text{C}} H_2C=CH-CH=CH_2$
55	Xauk-Zauer	Bir almashingan atsetilenlar katalizator (rux xlorid) ishtirokida ortoefirlar bilan ta'sirlashadi; $RC\equiv CH + R^1C(OC_2H_5)_2 \xrightarrow{\text{ZnCl}_2} RC\equiv C-C(OC_2H_5)_2$
56	Iotsich	Monoalmashingan atsetilenidlarni Grin'yar reaktivlari ta'sirida metallaganda alkenilmetalgalogenidlar (Iotsich reaktivlari) hosil bo'ladi; $RC\equiv CH + R^1-MgX \xrightarrow{\text{efir}} RC\equiv C-MgX$
57	Rayxert-Nyulend	Alkinlar molekulsga kisloli katalizatorlar ishtirokida aromatik halqa kiritiladi. $HC\equiv CR + 2 Ar-H \xrightarrow[\text{HgSO}_4 + \text{H}_2\text{SO}_4]{10-15^\circ\text{C}} \begin{array}{c} H & Ar \\ & \\ HC & -C- \\ & \\ H & Ar \end{array}$
58	Smirnov-Zamkov	Dimetilatsetilenni bir vaqtning o'zida siklodimerlash va xlorlash quyidagicha kechadi; $2CH_3C\equiv CCH_3 \xrightarrow{\text{SO}_2\text{Cl}_2} \begin{array}{c} Cl \\ \\ H_3C-C-CH_3 \\ \\ H_3C-C-CH_3 \\ \\ Cl \end{array}$
59	Nef	Ketonlarni ishqoriy metallar atsetilenidlari bilan etinillash; $\begin{array}{c} \diagup \\ C=O \\ \diagdown \end{array} + HC\equiv CM \xrightarrow{\text{suyuq NH}_3} \begin{array}{c} \diagup \\ C-CH\equiv CH \\ \\ OH \end{array}$
60	N.I.Nazarov	Qo'shbog' va uchbog' tutgan to'yinmagan uchlanchi spirt-dimetilvinilatsetilenmeanol kukunsimon kaliy gidroksid ishtirokida vinilatsetilen va atsetondan olinadi; $\begin{array}{c} H_3C \\ \diagup \\ C=O \\ \diagdown \\ H_3C \end{array} + HC\equiv C-CH=CH_2 \longrightarrow \begin{array}{c} OH \\ \\ H_3C-C-C\equiv C-CH=CH_2 \\ \\ CH_3 \end{array}$
61	S.B.Lebedov, 1928yil	Etil spirt bug'ini 400-500⁰Cda katalizator (ZnO+Al₂O₃)ustidan o'tkazish orqali 1,3-butadien oldi.

		$\text{CH}_3-\text{CH}_2-\text{OH} \longrightarrow \text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2 + 2\text{H}_2\text{O} + \text{H}_2$ Bu jarayon bir necha bosqichda boradi. $\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3-\text{C} \\ \backslash \\ \text{H} \end{array} + \begin{array}{c} \text{O} \\ \parallel \\ \text{H}-\text{CH}_2-\text{C} \\ \backslash \\ \text{H} \end{array} \longrightarrow$ $\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3-\text{CH}-\text{CH}_2-\text{C} \\ \quad \backslash \\ \text{OH} \quad \text{H} \end{array}$ III. $\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3-\text{CH}-\text{CH}_2-\text{C} \\ \quad \backslash \\ \text{OH} \quad \text{H} \end{array} + \text{H}_2 \longrightarrow \begin{array}{c} \text{O} \quad \text{O} \\ \parallel \quad \parallel \\ \text{CH}_3-\text{CH}-\text{CH}_2-\text{CH}_2 \\ \quad \\ \text{OH} \quad \text{OH} \end{array}$ IV. $\begin{array}{c} \text{O} \quad \text{O} \\ \parallel \quad \parallel \\ \text{CH}_2-\text{CH}-\text{CH}-\text{CH} \\ \quad \\ \text{OH} \quad \text{OH} \end{array} \longrightarrow \text{CH}_2=\text{CH}_2-\text{CH}_2=\text{CH}_2$
62	A.A.Balandin- O.K.Bagdanov	n-Butanni xromalyuminiyli katalizator ($\text{Al}_2\text{O}_3+\text{CrO}_3+\text{Cu}$ (II)tuzlari) ishtirokida 650°C da degidrogenlaganda oxirgi maxsulot sifatida 1,3-butadien hosil bo'ladi; $\begin{array}{c} \text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_3 \xrightarrow[600^\circ\text{C}]{-\text{H}_2} \begin{array}{l} \text{CH}_2=\text{CH}-\text{CH}_2-\text{CH}_3 \quad 34\% \\ \text{CH}_3-\text{CH}=\text{CH}-\text{CH}_3 \quad 66\% \end{array} \xrightarrow[650^\circ\text{C}]{-\text{H}_2} \text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2 \end{array}$
63	Prins	Izopren sanoatda izobutilen va fermaldegiddan Prins reaksiyasi asosida quyidagicha olinadi; $\begin{array}{c} \text{H}_3\text{C} \\ \backslash \\ \text{C}=\text{CH}_2 \\ / \\ \text{H}_3\text{C} \end{array} + \begin{array}{c} \text{O} \\ \parallel \\ \text{H}-\text{C} \\ \backslash \\ \text{H} \end{array} \xrightarrow[125^\circ\text{C}]{2.5\%\text{H}_2\text{SO}_4} \begin{array}{c} \text{H}_3\text{C} \quad \text{CH}_2 \\ \backslash \quad / \\ \text{C} \quad \text{CH}_2 \\ / \quad \backslash \\ \text{H}_3\text{C} \quad \text{O} \quad \text{O} \\ \backslash \quad / \\ \text{CH}_2 \\ \text{dimetilizodioksan} \end{array}$ $\xrightarrow[400^\circ\text{C}]{\text{H}_4\text{P}_2\text{O}_7+\text{SiO}_2} \begin{array}{c} \text{CH}_3 \\ \\ \text{H}_2\text{C}=\text{C}-\text{CH}=\text{CH}_2 \end{array} + \begin{array}{c} \text{O} \\ \parallel \\ \text{H}-\text{C} \\ \backslash \\ \text{H} \end{array} + \text{H}_2\text{O}$
64	Finkelshtayn	Natriy iodidning atsetondagi eritmasiga tegishli alkil xloridlarni ta'sir etirib tegishli alkiliodidlarni olish mumkin; $\text{R}-\text{Cl} + \text{NaJ} \longrightarrow \text{R}-\text{J} + \text{NaCl}$
65	Grinyar	Galogenalkanlar absolyut efir muhitida magniy bilan reaksiyaga kirishganda alkilmagniygalogenidlar(Grinyar reaktivlari) hosil bo'ladi; $\text{R-X} + \text{Mg} \xrightarrow{\text{efir}} \text{R-Mg-X}$
66	Zelinskiy	Zelinskiy usuli asosida yuqoridagi reaksiya quyidagicha boradi; $\text{R-MgX} + \text{CH}(\text{OR}')_3 \longrightarrow \text{R}^{\text{I}'}-\text{CH}-(\text{OR}^{\text{I}})_2 \xrightarrow{\text{H}_3\text{O}^+} \text{R-CHO}$

67	Vittig , 1953yil	Alkiliden fosforanlar (fodfoniy ilidlari) va al’degid yoki ketonlarning o’zaro reaksiyasida dastlab betainlar hosil bo’ladi. Betainlardan ortafosforetan bosqichi orqali alken va fosfinoksidlar olinadi; $\begin{array}{ccc} (\text{C}_6\text{H}_5)_3\text{P}-\text{CH}-\text{R} & \longrightarrow & (\text{C}_6\text{H}_5)_3\text{P}=\text{O} \\ & & + \\ \text{O}-\text{CH}-\text{R} & & \text{R}-\text{CH}=\text{CH}-\text{R}^1 \end{array}$
68	K.Sigler1950yil J.Natta1963yil	Propilenni 60-70 °C haroratda 6-10 atm bosimda Siglarning kompleks katalizatori $\text{Al}(\text{C}_2\text{H}_5)_3$ va TiCl_4 yoki $[(\text{C}_2\text{H}_5)_3\text{AlCl} \bullet \text{TiCl}_3]$ ishtirokida benzin yoki n-geptan muhitida polimerlaganda stereoregulyar (izotaktik)tuzilishli polimerlar hosil bo’ladi;  $n \text{CH}_3-\text{CH}=\text{CH}_2 \rightarrow \dots -\text{CH}(\text{CH}_3)-\text{CH}_2-[\text{CH}(\text{CH}_3)\text{CH}_2]_{n-2}-\text{CH}(\text{CH}_3)\text{CH}_2\dots$  va hokazc
69	Arens –Van-Drop	Karbonil birikmalar va etoksimagniy bromiddan α, β - to’yinmagan al’degidlar olish; $\text{>C=O} + \text{C}_2\text{H}_5\text{OC}\equiv\text{C}-\text{MgBr} \longrightarrow \begin{array}{c} \text{>C}\equiv\text{COC}_2\text{H}_5 \\ \\ \text{OH} \end{array}$ $\xrightarrow[\text{Pt}]{\text{H}_2} \begin{array}{c} \text{>C}-\text{CH}=\text{CHOC}_2\text{H}_5 \\ \\ \text{OH} \end{array} \xrightarrow{\text{gidroliz}} \begin{array}{c} \text{>C}=\text{CH}-\text{C} \\ \quad \quad \quad \text{O} \\ \text{OH} \quad \quad \quad \text{H} \end{array}$
70	K.Sigler	Sanoatda alyuminiyorganik birikmalarni oksidlab alkanollar olinadi.Reaksiya sxemasi; $\text{R}_3\text{Al} \xrightarrow{\text{O}_2} (\text{RO})_3\text{Al} \xrightarrow{\text{H}_2\text{O}} 3\text{ROH} + \text{Al}(\text{OH})_3$

71	Chugaev – Serevitinov-Terentov	Alkanollar magniyorganik birikmalar bilan reaksiyaga kirishib alkanlar hosil qiladi. $C_2H_5OH + CH_3MgCl \longrightarrow CH_4 + C_2H_5OMgCl$ Ajralib chiqqan metan hajmini o'lchash bilan alkanollarning gidroksil guruhi sonini aniqlash mumkin;
72	Lukas	Alkanollardan xloralkanlar sintez qilishda HCl va ZnCl₂ aralashmasining spirtidagi eritmasi ishlatiladi HCl va ZnCl₂ ning spirtidagi aralashmasi Lukas reagenti deyiladi; $R-\ddot{O}H + ZnCl_2 + HCl \rightleftharpoons R-\overset{\oplus}{O}-\overset{\ominus}{ZnCl_2} \xrightarrow{S_N1} R-Cl + ZnCl(OH)$
73	Jonson	Birlamchi spirtlarni CrO₃ va H₂SO₄(Jonson reaktivi) ishtirokida oksidlash Jonson reaksiyasi deyiladi; $R-CH_2OH \xrightarrow[H_2O, 15-20^\circ C]{CrO_3 + H_2SO_4} R-\overset{\overset{O}{\parallel}}{C}-H$ I. $R-CH_2OH + HO-\overset{\overset{O}{\parallel}}{Cr}-OH \longrightarrow RCH_2O-\overset{\overset{O}{\parallel}}{Cr}-OH + H_2O$ II. $RCH_2O-\overset{\overset{O}{\parallel}}{Cr}-OH + H_2O \longrightarrow R-\overset{\overset{O}{\parallel}}{C}-H + H_3O^+ \cdot HCrO_3$
74	Saretta	Birlamchi spirtlarni Saretta reaktivi (CrO₃*C₅H₅N*HCl) bilan oksidlab al'degidlar olish; $R-CH_2OH + CrO_3 \cdot C_5H_5N \cdot HCl \xrightarrow{Cu_2Cl_2} R-\overset{\overset{O}{\parallel}}{C}-H$
75	A.E.Arbuzov- B.A.Arbuzov	Alkilfosfon kislotalar R(PO)(OH)₂ hosilalarini olishda "Arbuzov qayta guruhlanishi" nomli reaksiyasi muhim o'rin tutadi. Bu reaksiyani amalga oshirish uchun fosfit kislotaning turli efirlariga galogenalkanlar ta'sir ettiriladi; [4,6,9] $(C_2H_5)_3P + CH_3J \longrightarrow [(C_2H_5O)PCH_3]^{\oplus} J^{\ominus} \longrightarrow$ $\xrightarrow{\Delta} (C_2H_5O)_2P(=O)CH_3 + C_2H_5J$
76	R.Bunzen 1837-1843 yillar	Dimetilarsenxloridi (kakodil xloridi) ga karbonat anhidrid muhitida rux metalini ta'sir ettirib tetrametildiarsen oldi; $(CH_3)_2AsCl \xrightarrow{CO_2, Zn} [(CH_3)_2As-O-As(CH_3)_2]$
77	Frankland 1849 yil	Etiliodid va ruxdan ruxorganik birikmalar (etilruxiodid)ni sintez qildi; $C_2H_5J + Zn \longrightarrow C_2H_5ZnJ$
78	V.Grinyar , 1912 yil	V.Grinyar magniyorganik birikmalar ustida ishlab Nobel mukofotiga sazovor bo'lgan olimdir .Magniyorganik birikmalar havosiz joyda quruq efir yoki tetragidrofuran (TGF) muhitida alkilgalogenidlarga magniy metalini ta'sir ettirib olinadi;

		$R-X + Mg + (C_2H_5)_2O \longrightarrow (C_2H_5)_2OMg \begin{array}{l} \nearrow R \\ \searrow X \end{array}$ Grinyar fikricha MgOB ning efir muhitida olinish jarayonida quyidagi tuzulishli organik oraliq modda hosil bo'ladi $\begin{array}{c} C_2H_5 \quad \quad MgX \\ \quad \quad \diagdown \quad \diagup \\ \quad \quad O \\ \quad \quad \diagup \quad \diagdown \\ C_2H_5 \quad \quad R \end{array}$ Sof MgOB amalda keng qo'llanilmaydi. Ular eritmada Grinyar reaktivi bilan dinamik muvozanatda bo'ladi va efir muhitida osonlik bilan asotsiatlar hosil qiladi;[4,6,7] $(C_2H_5MgCl)_2 \rightleftharpoons (C_2H_5)_2Mg + MgCl$ $2R-MgCl \xrightleftharpoons{(C_2H_5)_2O} \begin{array}{c} \begin{array}{c} \oplus \\ R-Mg \end{array} \begin{array}{c} \diagup Cl \\ \diagdown \end{array} \begin{array}{c} \oplus \\ Mg-R \end{array} \\ \begin{array}{c} \diagdown (C_2H_5)_2O \\ \diagup \end{array} \end{array}$
79	Klemensen , 1913 yil	Aldegid va ketonlar rux amalgamasi va konsentrlangan xlorid kislotasi ta'sirida uglevodorodlarga aylanadi; $\begin{array}{c} R \\ \diagdown \\ C=O \\ \diagup \\ R \end{array} \xrightarrow{2Zn, 4H} \begin{array}{c} R \\ \diagdown \\ CH_2 \\ \diagup \\ R \end{array} + 2Zn^{2+} + H_2O$
80	Vilyamson	Alkogolyatlarga alkilgalogenidlar yoki alkilsulfatlarni ta'sir ettirib, dialkil efirlar olinadi; $R-\overset{\ominus}{O}Na^{\oplus} + R'-X \longrightarrow R-O-R' + NaX$
81	Zelinskiy	Aldegid guruhi saqlagan birikmalarga Grinyar reaktivi ishtirokida alkil guruhini kiritish ; $R-MgX + HC(OR^I)_3 \longrightarrow RCH(OR^I)_2 \xrightarrow{H_3O^{\oplus}} R-\overset{\overset{O}{\parallel}}{C}-H$
82	Mixaelis –Bekker	Dialkilfosfit tuzlaridan alkilfosfon kislotalar olish;[5-7] $\begin{array}{c} RO \\ \diagdown \\ P-OM \\ \diagup \\ RO \end{array} + R''-X \xrightarrow[erituvchi]{25^{\circ}C} \left[\begin{array}{c} X \\ \diagup \\ RO \\ \diagdown \\ P-OM \\ \diagup \\ RO \\ \diagdown \\ R'' \end{array} \right] \longrightarrow \begin{array}{c} RO \\ \diagdown \\ P=O \\ \diagup \\ RO \\ \diagdown \\ R \end{array}$
83	Butlerov-L'vov	Galogen atomini alkilga almashtirish;[7] $R_3C-X + R^I Zn-R^I \xrightarrow[inert\ erituvchi]{-ZnRX} R_3C-R^I$
84	Chugaev – Serevitinov	Metilmagniy iodidga MgI-guruhini vodorod atomiga almashinishidan metan hosil bo'ladi . Bu reaksiya yordamida organik birikmalar tarkibidagi harakatchan vodorod miqdori aniqlanadi; $CH_3MgJ + Z-H \longrightarrow CH_4 + Z-MgJ$ $Z=RO, RNH, RS$
85	Grovensteyn-Shimmerman	Metallar katalizatorligida 1,1,1-trifeniletandan 1,1,2-trifeniletanga izomerlanadi;

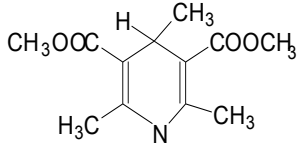
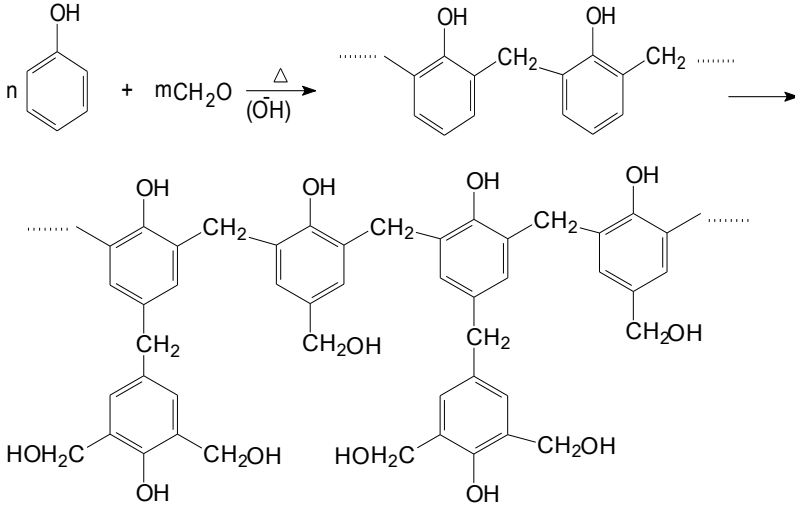
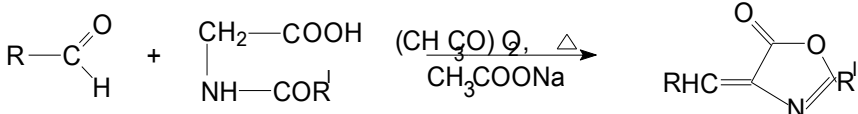
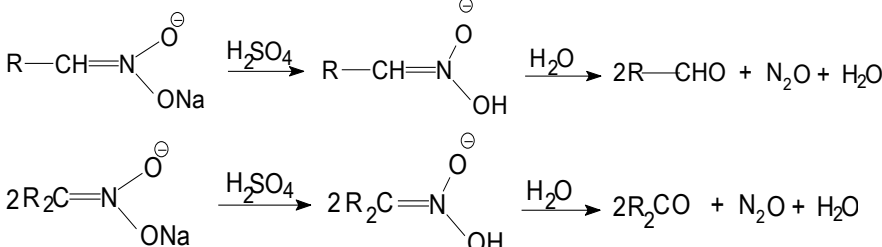
		$\text{Ph}_2\text{C}^{\ominus}\text{CH}_2\text{M}^{\oplus} \xrightarrow{\text{M}} \text{PhC}^{\ominus}\text{CH}_2\text{PhM}^{\oplus}$ Ph = fenil M = Na, K, Li, Mg
86	Iborn	Alyuminiy iodid katalizatorligida tetraalkilsilan molekulasidagi alkilni iodga almashtirish ; $\text{R}_3\text{—Si—R} \xrightarrow[\text{(AlJ)}_3, \text{benzol}]{\text{J}_2, \Delta} \text{R}_3\text{—Si—I}$
87	V.Grinyar	Karbonil birikmalarni Grinyar reaktivi ishtirokida quyidagicha qaytarish mumkin. $>\text{C=O} + \text{R—MgX} \longrightarrow \left[\begin{array}{c} \diagup \text{C} \diagdown \\ \\ \text{R} \end{array} \text{—O—MgX} \right] \xrightarrow{\text{H}_2\text{O}} \begin{array}{c} \diagup \text{C} \diagdown \\ \\ \text{R} \end{array} \text{—O—H}$
88	Vagner	Karbonil birikmalarni dialkilrux bilan qaytarish quyidagi mexanizm asosida amalgam oshadi; $\begin{array}{c} \text{R} \\ \diagdown \\ \text{C=O} \\ \diagup \\ \text{H} \end{array} + \text{R}'\text{—ZnR}' \longrightarrow \left[\begin{array}{c} \text{R} \\ \diagdown \\ \text{C} \diagup \\ \\ \text{H} \end{array} \text{—O—ZnR}' \right] \xrightarrow{\text{H}_2\text{O}} \begin{array}{c} \text{R} \\ \diagdown \\ \text{C} \diagup \\ \\ \text{H} \end{array} \begin{array}{c} \text{H} \\ \diagup \\ \text{OH} \\ \diagdown \\ \text{R}' \end{array}$
89	Zaytsev	Ketonlar va alkilrux galogenidlardan quyidagi sxema bo'yicha uchlamchi spirtlarni sintez qildi. [4,8,9] $\begin{array}{c} \text{R} \\ \diagdown \\ \text{C=O} \\ \diagup \\ \text{H} \end{array} + \text{R}'\text{—ZnX} \longrightarrow \left[\begin{array}{c} \text{R} \\ \diagdown \\ \text{C} \diagup \\ \\ \text{H} \end{array} \text{—O—ZnX} \right] \xrightarrow{\text{H}_2\text{O}} \begin{array}{c} \text{R} \\ \diagdown \\ \text{C} \diagup \\ \\ \text{H} \end{array} \begin{array}{c} \text{OH} \\ \diagup \\ \text{R} \end{array}$
90	Shorigin- Vanklin	Karbonil birikmalar karboniliga natriy organik birikmalar biriktiriladi. Hosil bo'lgan oraliq mahsulot gidroliz qilinganda spirtlar hosil bo'ladi; $>\text{C=O} + \text{R—Na} \longrightarrow \begin{array}{c} \diagup \text{C} \diagdown \\ \\ \text{R} \end{array} \text{—O—Na} \xrightarrow{\text{H}_2\text{O}} \begin{array}{c} \diagup \text{C} \diagdown \\ \\ \text{R} \end{array} \text{—O—H}$
91	Buvo	Grinyar reaktivlarini dialmashingan formamidlar bilan formillash; $\text{R—MgBr} + \begin{array}{c} \diagup \text{N} \diagdown \\ \\ \text{CHO} \end{array} \xrightarrow{\text{efir}} \text{R—CHO}$
92	Bodr-Chichibabin	Grinyar reaktivlari bilan ortachumoli efirning reaksiyasidan hosil bo'ladigan atsetalning gidrolizlanishi natijasida al'degidlar hosil bo'ladi; [7,10] $\text{R}'\text{—MgBr} + \begin{array}{c} \text{CH(OR)}_2 \\ \\ \text{OR} \end{array} \xrightarrow[2. \text{HCl, sovutish}]{1. \Delta} \begin{array}{c} \text{OR} \\ \diagup \text{RCH} \diagdown \\ \text{OR} \end{array} \longrightarrow \text{R—C} \begin{array}{c} \text{O} \\ \diagup \\ \text{H} \end{array}$
93	Aterton-Todd	Aminlarni asoslar va tetraxlormetan ishtirokida dialkilfosfitlar bilan fosforillash; $\begin{array}{c} \diagup \text{N} \diagdown \\ \\ \text{H} \end{array} + (\text{OR})_2\text{P} \begin{array}{c} \text{H} \\ \\ \text{O} \end{array} \xrightarrow[\text{(C}_2\text{H}_5)_3\text{N}]{\text{CCl}_4} \begin{array}{c} \diagup \text{N} \diagdown \\ \\ \text{P} \end{array} \begin{array}{c} \text{OR} \\ \\ \text{O} \end{array}$
94	Simmons –Smit	Alkenlarga Simmons –Smit reaktivi (JCH₂ZnJ) ta'sir ettirilganda siklopropanlar hosil bo'ladi;

		$\begin{array}{c} \diagup \\ \text{C}=\text{C} \\ \diagdown \end{array} + \text{J}-\text{CH}_2-\text{ZnJ} \xrightarrow{\text{efir}} \begin{array}{c} \diagup \quad \diagdown \\ \text{C}-\text{C} \\ \\ \text{CH}_2 \end{array}$
95	Kabachnik-Filds	Al'degidlar bilan aminlar yoki ammiak reaksiyasi jarayonida vodorod atomi aminoalkil guruhiga almashinadi $\text{Y}-\text{H} + \begin{array}{c} \text{O} \\ \parallel \\ -\text{C} \\ \\ \text{H} \end{array} + \begin{array}{c} \\ -\text{N}-\text{H} \\ \end{array} \longrightarrow \text{Y}-\begin{array}{c} \\ \text{CH} \\ \\ \text{N} \end{array}$ Fosfor bilan bog'langan harakatchan vodorod atomining aminoalkil guruhiga almashinishi (P-aminoalkillash) natijasida α-aminoalkilfosfonkislotalarning efirlari hosil bo'ladi; $(\text{RO})\text{P}_2-\begin{array}{c} \text{O} \\ \parallel \\ \text{H} \end{array} + \begin{array}{c} \text{O} \\ \parallel \\ -\text{C}- \\ \end{array} + \begin{array}{c} \diagup \\ \text{NH} \\ \diagdown \end{array} \xrightarrow[\text{etanol}]{\Delta} (\text{RO})_2\text{P}=\begin{array}{c} \diagup \\ \text{C} \\ \\ \text{N} \end{array}$
96	Freynd, 1882 yil	Digalogenalkanlarni natriy bilan degalogenlash orqali sikloalkanlar olinadi; $\begin{array}{c} \text{CH}-\text{X} \\ \\ (\text{CH})_{n-2} \\ \\ \text{CH}-\text{X} \end{array} \xrightarrow[-2\text{NaX}]{2\text{Na}} \text{Cyclo}(\text{CH})_n$
97	G.G.Gustavson 1887 yil	Digalogenalkanlarni rux bilan degalogenlash orqali sikloalkanlar olinadi; $\begin{array}{c} \text{CH}-\text{X} \\ \\ (\text{CH})_{n-2} \\ \\ \text{CH}-\text{X} \end{array} \xrightarrow[-\text{ZnX}_2]{\text{Zn}} \text{Cyclo}(\text{CH})_n$
98	Kinner-Uilson, 1967 yil	Siklobutan va siklopentanni olish uchun 1,4 va 1,5 digalogenalkanlarga litiy amalgamasi ta'sir ettiriladi; $\begin{array}{c} \text{Br} \\ \\ (\text{CH}_2)_4 \\ \\ \text{Br} \end{array} + 2\text{LiHg} \xrightarrow[\text{yoki TGF}]{\text{dioksan}} \text{Cyclobutan} + 2\text{LiBr} + 2\text{Hg}$
99	Videkvist	Brommalon kislota dinitrilining ikki molekulasini bilan al'degid yoki ketonlarni kaliy iodid ishtirokida siklokondensatsiya natijasida siklopropan halqasi hosil bo'ladi; [4,8-10] $\begin{array}{c} \diagup \\ \text{C}=\text{O} \\ \diagdown \end{array} + 2\text{BrCH}(\text{CN})_2 \xrightarrow[\text{suv+etanol}]{\text{KJ}} \begin{array}{c} \diagup \quad \diagdown \\ \text{C} \\ \quad \\ \text{CN} \quad \text{CN} \end{array}$
100	Finkel'shtayn	Alkiliiodidlarni olish uchun natriy iodidning atsetondagi eritmasiga tegishli alkilxloridlar ta'sir ettiriladi; $\text{R}-\text{Cl} \xrightarrow[\text{atseton}]{\text{NaJ}} \text{R}-\text{J} + \text{NaCl}$
101	Perkin 1883 yil	Uch, to'rt, besh va olti a'zoli sikllarni olish uchun natriymalon efiriga tegishli ravishda 1,2; 1,3; 1,4; 1,5-digalogenalkanlar ta'sir ettiriladi; $\begin{array}{c} \text{CH}_2-\text{CH}_2-\text{Br} \\ \\ \text{CH}_2-\text{CH}_2-\text{Br} \end{array} \xrightarrow[-\text{NaBr}]{\text{Na-CH}(\text{COOC H})_2} \begin{array}{c} \text{CH}_2-\text{CH}_2-\text{Br} \\ \\ \text{CH}_2-\text{CH}_2-\text{CH}(\text{COOC H})_2 \end{array} \longrightarrow$ $\xrightarrow[-\text{CH}_2\text{COOC H}]{\text{Na-CH}(\text{COOC H})_2} \begin{array}{c} \text{CH}_2-\text{CH}_2-\text{Br} \\ \\ \text{CH}_2-\text{CH}_2-\text{C}(\text{Na})(\text{COOC H})_2 \end{array} \xrightarrow[-\text{NaBr}]{\text{Na-CH}(\text{COOC H})_2} \begin{array}{c} \text{CH}_2-\text{CH}_2 \\ \\ \text{CH}_2-\text{CH}_2-\text{C}(\text{COOC H})_2 \end{array}$

		$\xrightarrow[-C_2H_5OH]{2H_2O^+} \begin{array}{c} CH_2 \\ \\ CH_2 - C(COOH)_2 \\ \\ CH_2 - CH_2 \end{array} \xrightarrow[-CO_2]{\Delta} \begin{array}{c} CH_2 \\ \\ CH_2 - C - COOH \\ \\ CH_2 - CH_2 \end{array}$
102	Vyurs 1855 yil	Galogenalkanlarga natriy metalli ta'sir ettirib alkanlar olish;[4,8,9]  —————→ CH₃—CH₂—CH₂—CH₃ +NaBr
103	P.P.Shorigin	Shu reaksiya mexanizmini Shorigin ishlab chiqqan; $CH_3-CH_2-Br + Na \longrightarrow [CH_3-CH_2-Br]^\ominus + Na^\oplus$ $[CH_3-CH_2-Br]^\ominus \longrightarrow CH_3-\dot{C}H_2 + Br^\ominus$ $2CH_3-\dot{C}H_2 \longrightarrow CH_3-CH_2-CH_2-CH_3$
104	Perkin	β -dikarbonil birikmalarni digalogenalkanlar bilan natriy alkogolyatlar ishtirokida sikloalkillash; $\begin{array}{c} ROOC \\ \\ C \\ \\ ROOC \end{array} \begin{array}{c} H \\ \\ C \\ \\ H \end{array} + X-CH_2(CH_2)_nCH_2-X \xrightarrow[-HX]{C_2H_5ONa} \begin{array}{c} ROOC \\ \\ C \\ \\ ROOC \end{array} \begin{array}{c} CH_2 \\ \\ CH_2 \\ \\ CH_2 \end{array} (CH_2)_n$
105	Kol'be	Natriy sianid ta'sirida galogenalkanlardan nitrillar sintez qilish; $R-X \xrightarrow{NaCN, \Delta} R-CN + NaX$
106	Grishkevich-Troximovskiy-Mak-Kombi	Galogensirka kislotalar efirlaridagi galogeni kalium fluorid ta'sirida ftorga almashinishi; $X-CH_2-COOR \xrightarrow{KF, 200-300^\circ C} F-CH_2COOR$ X=Cl, Br
107	Svarts	Surma trifloridi ta'sirida poligalogenidlardagi galogen ftorga qisman almashinadi; $CCl_3-CCl_2-CCl_3 \xrightarrow{SbF_3 (dixloretan)} CF_2Cl-CCl_2-CFCl_2 + SbCl_5$
108	Gilmen-Nelson	Bu reaksiyada galogenangidrid molekulasidagi xlor alkilga almashinib keton hosil bo'ladi;[3,8] $2R-\overset{\overset{O}{\parallel}}{C}-Cl + R^1\overset{\overset{O}{\parallel}}{C}-R^1 \xrightarrow{benzol} 2R-\overset{\overset{O}{\parallel}}{C}-R^1$
109	V.Meyer , 1872yil	Iod va bromalkanlarga kumush nitrat ta'sir ettirilganda nitroalkan bilan alkinitritlar aralashmasi hosil bo'ladi; $R-J + 2 AgNO_2 \longrightarrow RNO_2 + R-ONO + 2 AgJ$
110	Koriblyum 1947 yil	Narxi qimmat kumush nitratni kalium nitrat yoki natriy nitratga almashtirish maqsadida nitroalkanlar olish reaksiyasi aprotonli erituvchilar (Dimetilsulfo kislotalar yoki dimetilformamid)da olib boriladi; $R-X + NaNO_2 \xrightarrow[(CH_3)_2SO]{(CH_3)_2NCHO} R-NO_2 + NaX$ Bu reaksiyada ham asosan nitroalkanlar va oz miqdorda alkinitritlar hosil bo'ladi;
111	Ter Meer	α -Galogennitroalkanlarni ishqoriy muhitda nitrolab gem-dinitroalkan olish;

		$\begin{array}{ccc} \text{R}-\text{CHNO}_2 & \xrightarrow{\text{KNO}_2, \text{KOH}} & \text{RCHNO} \\ & & \\ \text{X} & & \text{NO}_2 \end{array}$
112	Delepin	Bu bilvosita aminlash reaksiyasiga yaxshi misol bo'la oladi. Urotropin tasirida galogenalkanlardagi galogen atomi amino guruhga almashinadi to'rtlamchi tuzlarning hosil bo'lish bosqichi orqali boradigan bu reaksiya mahsuloti kislotali muhitda gidroliz qilinganda alkilamin xlorhidrati hosil bo'ladi; $\text{RCH}_2-\text{X} \xrightarrow[\text{CHCl}_3]{\text{C}_6\text{H}_{12}\text{N}_4, \Delta} \text{C}_6\text{H}_{12}\text{N}_4^{\oplus}-\text{CH}_2\text{R})\text{X}^{\ominus} \xrightarrow[\text{suv+etanol}]{\text{HCl}} \text{RCH}_2-\text{NH}_2 \cdot \text{HCl}$ to'rtlamchi tuz
113	Teylor-Mak-Kilop	β-Dikarbonil birikmalarni alkillash ularning talliyli tuzlari olish va bu tuzlarni alkilgalogenidlar bilan ta'sirlashuvi orqali amalgam oshadi; [7,8-10] $\begin{array}{c} \text{—C—CH}_2\text{—C—} \\ \quad \quad \\ \text{O} \quad \quad \text{O} \end{array} \xrightarrow[\text{inert erituvchi}]{\text{CH}_3\text{OTl}} \left[\begin{array}{c} \text{—C—CH}_2\text{—C—} \\ \quad \quad \\ \text{O} \quad \quad \text{O} \end{array} \right]^{\ominus} \text{Tl}^{\oplus} \xrightarrow[\Delta]{\text{R—X}} \begin{array}{c} \text{—C—CH—C—} \\ \quad \quad \\ \text{O} \quad \text{R} \quad \text{O} \end{array}$
114	A.M. Butlerov	Chumoli al'degid ammiak ta'sirida geksametilentetraazin (urotropin) ga aylanadi; $6\text{H—C} \begin{array}{l} \text{O} \\ // \\ \text{H} \end{array} + 4\text{NH}_3 \longrightarrow \begin{array}{c} \text{N} \\ / \quad \backslash \\ \text{CH}_2 \quad \text{CH}_2 \\ \quad \quad \\ \text{N} \quad \quad \text{N} \\ / \quad \backslash \quad / \quad \backslash \\ \text{H}_2\text{C} \quad \text{H}_2\text{C} \\ \quad \quad \\ \text{N} \quad \quad \text{N} \\ \backslash \quad / \quad \backslash \quad / \\ \text{CH}_2 \quad \text{CH}_2 \end{array}$
115	Butlerov	Farmaldegidning avtokondensatsiyasi natijasida geksozalar ("formozalar") olinadi; [4,7] $\text{CH}_2\text{O} \xrightarrow[\text{Ca(OH)}_2 + \text{HOH}]{20^\circ\text{C}} \text{CH}_2\text{OH—CHO} \xrightarrow{\text{CH}_2\text{O}} \text{C}_6\text{H}_{10}\text{O}_5$
116	Kanissaro, 1853 yil	Harakatchan α-vodorodlari yo'q al'degidlar ishqorning suvdagi yoki spirdagi konsentrlangan eritmasi ta'sirida oksidlanish-qaytarilish reaksiyasiga kirishib spirt va karbon kislota tuzining ekvimolyar aralashmasini hosil qiladi; $\text{H—C} \begin{array}{l} \text{O} \\ // \\ \text{H} \end{array} \xrightarrow{50\% \text{ NaOH}} \text{CH}_3\text{OH} + \text{H—COONa}$ $2(\text{CH}_3)_2\text{C} \begin{array}{l} \text{O} \\ // \\ \text{H} \end{array} \xrightarrow{50\% \text{ KOH}} 2(\text{CH}_3)_2\text{C—OH} + 2(\text{CH}_3)_2\text{C—COOK}$
117	V.I. Tishchenko	Al'degidlarga suvsiz muhitda alyuminiy alkogolyat masalan $\text{Al(OC}_2\text{H}_5)_3$ ta'sir ettirilganda shiddatli reaksiya borib murakkab efirlar hosil bo'ladi; $\text{CH}_3\text{—C} \begin{array}{l} \text{O} \\ // \\ \text{H} \end{array} + \text{H—C} \begin{array}{l} \text{O} \\ // \\ \text{H} \end{array} \text{—CH}_3 \xrightarrow{\text{Al(OC}_2\text{H}_5)_3} \text{H}_3\text{C—C} \begin{array}{l} \text{O} \\ // \\ \text{O—CH}_2\text{—CH}_3 \end{array}$ Bu reaksiyada sirka al'degidning qaytarilgan bir molekulasini ikkinchi molekula hisobiga oksidlanadi. Ketonlar bunday reaksiyaga kirishmaydi;

118	Kanissaro	Gliksal konsentrlangan ishqor ta'sirida gidroksisirka (glikol) kislotani hosil qiladi; $\begin{array}{c} \text{O} & & \text{O} \\ \parallel & & \parallel \\ \text{H}-\text{C}- & \text{C}-\text{H} \end{array} + \text{H}_2\text{O} \xrightarrow{\text{KOH}} \begin{array}{c} \text{HO} & & \text{O} \\ & & \parallel \\ \text{H}-\text{CH}- & \text{C}-\text{OH} \end{array}$
119	Tollens	Karbonil birikmalarni Tollens bo'yicha oksimetillashda formal'degidning bir necha molekulasini al'dol kondensatsiyasiga kirishadi; $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{CH}_2- \end{array} + \text{CH}_2\text{O} \xrightarrow{\text{K}_2\text{CO}_3} \begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{CH}_2- \\ \\ \text{CH}_2\text{OH} \end{array} \xrightarrow{\text{CH}_2\text{O}} \begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{C}-\text{CH}_2\text{OH} \\ \quad \\ \text{H} \quad \text{CH}_2\text{OH} \end{array}$
120	Radionov, 1926 yil	Malon kislotani al'degidlar va ammiak bilan o'zaro ta'sirlashuvi –Radionov reaksiyasi bilan aminokislotalar sintez qilishning birinchi bosqichi hisoblanadi; $\begin{array}{c} \text{RC}(\text{COOH})_2 \\ \\ \text{H} \end{array} + \begin{array}{c} \text{O} \\ \parallel \\ \text{R}'-\text{C}-\text{H} \end{array} \xrightarrow[\text{etanol}]{\text{NH}_3, \Delta} \begin{array}{c} \text{RC}(\text{COOH})_2 \\ \\ \text{RCHNH}_2 \end{array} \longrightarrow \begin{array}{c} \text{RCHCOOH} \\ \\ \text{RCHNH} \end{array}$
121	Debus	α-Dikarbonil birikma, al'degid va ikki molekula ammiakning siklokondensatsiyasi natijasida imidazolarning hosil bo'lishi; $\begin{array}{c} \text{R}-\text{C}-\text{C}-\text{R} \\ \parallel \quad \parallel \\ \text{O} \quad \text{O} \end{array} + \begin{array}{c} \text{O} \\ \parallel \\ \text{R}-\text{C}-\text{H} \end{array} + 2\text{NH}_3 \xrightarrow[\text{(suv)}]{0^\circ\text{C}} \begin{array}{c} \text{R} \quad \quad \text{N} \\ \diagdown \quad \diagup \\ \text{C} \quad \quad \text{C} \\ \diagup \quad \diagdown \\ \text{R} \quad \quad \text{N} \\ \\ \text{H} \end{array}$
122	Ganch	Uch molekula al'degid va bir molekula ammiakning siklokondensatsiyasidan piridinlarning hosil bo'lishi; $3\text{R}-\text{CH}_2-\text{C}(=\text{O})-\text{H} + \text{NH}_3 \xrightarrow[\text{(suv)}]{\text{CH}_3\text{COONH}_4, 200-250^\circ\text{C}} \begin{array}{c} \text{CH}_2\text{R} \\ \\ \text{R}-\text{C}_5\text{H}_4-\text{N} \\ \\ \text{R} \end{array} + \begin{array}{c} \text{R} \quad \quad \text{R} \\ \quad \quad \\ \text{C} \quad \quad \text{C} \\ \quad \quad \\ \text{N} \quad \quad \text{CH}_2 \\ \\ \text{R} \end{array}$
123	Robinson-Shyopf	Bu reaksiya uchta molekula ishtirokida boradigan polikondensatsiyaga misol bo'la oladi; $\text{HOCH}_2\text{CH}_2\text{CHO} + \text{RNH}_2 + \begin{array}{c} \text{CH}_2\text{COO} \\ \diagup \quad \diagdown \\ \text{O}=\text{C} \quad \text{C} \\ \diagdown \quad \diagup \\ \text{CH}_2\text{COO} \end{array} \text{Ca} \longrightarrow \begin{array}{c} \text{O} \\ \parallel \\ \text{C} \end{array} \begin{array}{c} \text{CH}_2\text{COO} \\ \diagup \quad \diagdown \\ \text{O}=\text{C} \quad \text{C} \\ \diagdown \quad \diagup \\ \text{CH}_2\text{COO} \end{array} \text{NR} (\text{CH}_2)_n$
124	Fayst-Benar	β-Dikarbonil birikmalarni α-galogenketonlar bilan asoslar ta'sirida boradigan siklokondensatsiyasi natijasida almashingan furanlar hosil bo'ladi; $\begin{array}{c} \text{R}-\text{C}-\text{CH}_2-\text{C}-\text{R}' \\ \parallel \quad \parallel \\ \text{O} \quad \text{O} \end{array} + \begin{array}{c} \text{R}''-\text{C}-\text{CH}_2-\text{Cl} \\ \parallel \\ \text{O} \end{array} \longrightarrow \begin{array}{c} \text{R}'' \quad \quad \text{COR}' \\ \diagdown \quad \diagup \\ \text{C} \quad \quad \text{C} \\ \diagup \quad \diagdown \\ \text{O} \quad \quad \text{R} \end{array}$
125	Ganch, 1882 yil	β-ketokislotalar efirlarining al'degidlar va ammiak bilan siklokondensatsiyasi natijasida olinadigan digidropiridinlarni oksidlab almashingan piridinlar olinadi;

		$\text{H}_3\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2\text{COOCH}_3 + \text{CH}_3\text{CHO} + \text{NH}_3 \longrightarrow$ 
126	Bekeland-Lederer-Manass	Fenolning mo'l olingan formal'degid bilan Opolikondensatsiyasi fenol-formaldegidli smolalar olishning sanoat usuli hisoblanadi; 
127	Shmidlin-Bergman-Uilsmor	Atsetonni piroliz qilib keten olish; $(\text{CH}_3)_2\text{C}=\text{O} \xrightarrow{550^\circ\text{C}} \text{CH}_2=\text{C}=\text{O}$
128	Erlenmeyer - Plyoxl	N-atsilglitsin aldegidlar bilan sirka anhidrid katalizatorligida reaksiyaga kirishganda azlaktonlar hosil bo'ladi; 
129	UP't	Alifatik karbonil birikmalar va sianid kislotadan KOH ishtirokida sianollar olish; $\text{>C=O} + \text{HCN} \xrightarrow[\text{(KOH)}]{0^\circ\text{C}} \text{>C}(\text{CN})(\text{OH})$
130	Nef, 1894 yil	Birlamchi va ikkilamchi atsenitroalkanlarning tuzlari xona haroratida suyiltirilgan ma'dan kislotalar ta'sirida al'degid va ketonlarni hosil qiladi. Bu jarayonda atse-nitro birikma hosil bo'lishi bilanoq gidrolizlanadi;[7,8] 
131	Anri	Birlamchi va ikkilamchi nitroalkanlar kuchsiz ishqoriy muhitda al'degid va ketonlar bilan reaksiyaga kirishib nitrospirtlarni hosil qiladi;

		$ \begin{array}{c} \text{R} \\ \\ \text{R}-\text{CH} \\ \\ \text{NO}_2 \end{array} \begin{array}{l} \xrightarrow{\text{H}-\text{CHO}} \\ \xrightarrow{\text{R}_2\text{C}=\text{O}} \end{array} \begin{array}{c} \text{R} \\ \\ \text{R}-\text{C}-\text{CH}_2\text{OH} \\ \\ \text{NO}_2 \\ \text{R} \quad \text{R} \\ \quad \\ \text{R}-\text{C}-\text{C}-\text{OH} \\ \quad \\ \text{NO}_2 \quad \text{R} \end{array} $
132	Shiff	Al'degidlarni birlamchi aminlar bilan ishqor ishtirokida iminlash; $ \begin{array}{c} \text{R} \\ \diagup \\ \text{C}=\text{O} \\ \diagdown \\ \text{H} \end{array} \begin{array}{c} \text{H} \\ \\ \text{N}-\text{R}' \\ \\ \text{H} \end{array} \xrightarrow[\text{(KOH)}]{\Delta, \text{(suv)}} \begin{array}{c} \text{R} \\ \diagup \\ \text{C}=\text{NR}' \\ \diagdown \\ \text{H} \end{array} + \text{H}_2\text{O} $
133	Shtaudinger	Karbonil birikmalarni iminotrifenilfosforanlar bilan iminlash; $ \text{C}=\text{O} + \text{Ph}_3\text{P}=\text{NR} \longrightarrow \text{C}=\text{NR} $ Ph-fenil
134	Byuxner-Kursius-Shlotterbek	Al'degidlarni diazometan bilan metilenlanganda uglerod-uglerod, uglerod-vodorod va karbonil guruhga birikish mahsulotlari hosil bo'ladi; [6,7] $ \begin{array}{c} \text{O} \\ \\ \text{RC} \\ \\ \text{H} \end{array} + \text{CH}_2\text{N}_2 \begin{cases} \longrightarrow \text{R}-\text{CH}_2-\text{C}(=\text{O})-\text{H} \\ \longrightarrow \text{R}-\text{C}(=\text{O})-\text{CH}_2-\text{H} \\ \longrightarrow \text{R}-\text{CH}(\text{O})-\text{CH}_2 \end{cases} $
135	Ganch , 1888 yil	Tiazol va uning gomolaglarini sintez qilish uchun xlorketon yoki α-xloral'degidlarga tioamidlar ta'sir ettiriladi; $ \begin{array}{c} \text{H}-\text{C}=\text{O} \\ \\ \text{H}-\text{C}=\text{O} \end{array} + \begin{array}{c} \text{H}_2\text{N} \\ \\ \text{CH} \\ \\ \text{S} \end{array} \xrightarrow{-\text{HCl}; \text{H}_2\text{O}} \text{tiazol} $
136	Stork	Karbonil birikmalarni α-alkillash uchun ularni dastlab enaminnarga aylantiriladi. So'ngra enaminnar alkilgalogenidlar bilan alkillanadi; $ \begin{array}{c} \text{O} \\ \\ -\text{C}-\text{CH}_2- \end{array} + \begin{array}{c} \diagup \\ \text{NH} \\ \diagdown \end{array} \xrightarrow{\Delta} \begin{array}{c} -\text{C}=\text{CH}- \\ \\ \text{N} \end{array} \xrightarrow{\text{R-X}} \begin{array}{c} -\text{C}=\text{C}- \\ \quad \\ \text{N} \quad \text{R} \end{array} \xrightarrow{\text{H}_2\text{O}} \begin{array}{c} \text{O} \\ \\ -\text{C}-\text{CH}- \\ \quad \quad \\ \quad \quad \text{R} \end{array} $
137	Meyer	β-Dikarbonil birikmalar eritmalarida enol shakllar miqdorini aniqlash uchun C=C boqqa bromni birikishidan foydalaniladi; $ \begin{array}{c} \text{RC}=\text{CH}-\text{C}-\text{R}' \\ \quad \quad \\ \text{OH} \quad \quad \text{O} \end{array} \xrightarrow[\text{C}_2\text{H}_5\text{OH}]{\text{Br}} \left[\begin{array}{c} \text{Br} \\ \\ \text{RC}-\text{HC}-\text{CCR}' \\ \quad \\ \text{OH} \quad \text{Br} \end{array} \right] \longrightarrow \dots $
138	Xunsdikker-	Karbon kislotalar kumushli tuzlarining brom yoki xlor

	Barodin	ishtirokida dekarboksillanishidan alkilgalogenidlar hosil bo'ladi; $\text{R}-\text{C}\begin{matrix} \text{O} \\ \parallel \\ \text{OAg} \end{matrix} + \text{Br}_2 \longrightarrow \text{RBr} + \text{CO}_2 + \text{AgBr}$ $\text{R}-\text{C}\begin{matrix} \text{O} \\ \parallel \\ \text{OAg} \end{matrix} + \xrightarrow[+\text{Br}_2]{-\text{AgBr}} \text{R}-\text{C}\begin{matrix} \text{O} \\ \parallel \\ \text{O} \cdots \text{Br} \end{matrix} \longrightarrow \text{Br} \cdot + \text{R}-\text{C}\begin{matrix} \text{O} \\ \parallel \\ \text{O} \cdot \end{matrix} \xrightarrow{-\text{CO}_2} \text{R} \cdot + \text{Br} \cdot \longrightarrow \text{RBr}$
139	Meerveyn-Pondorf -Verley, 1925-1926 yillar	Aldegid va ketonlarni izopropanol eritmasida alyuminiy izopropilat bilan qizdirilganda ular tegishli ravishda birlamchi va ikkilamchi spirtlarga qaytariladi; $\text{R}-\text{C}\begin{matrix} \text{O} \\ \parallel \\ \text{R} \end{matrix} + \text{H}_3\text{C}-\text{CH}(\text{OH})-\text{CH}_3 \xrightleftharpoons[\text{Al}(\text{OCH}(\text{CH}_3)_2)_3]{3\Delta} \text{H}_3\text{C}-\text{C}\begin{matrix} \text{O} \\ \parallel \\ \text{H}_3\text{C} \end{matrix} + \text{R}-\text{CH}(\text{OH})-\text{CH}_3$
140	Rozenmund 1918 yil	Karbon kislotalarni aldegidlarga to'g'ridan-to'g'ri qaytarish qiyin. Shuning uchun ham ularning xlorangidridlarini palladiy ishtirokida qaytarib al'degidlar olinadi; $\text{R}-\text{C}\begin{matrix} \text{O} \\ \parallel \\ \text{OH} \end{matrix} \xrightarrow[\text{-SO}_2\text{-HCl}]{\text{SOCl}_2} \text{R}-\text{C}\begin{matrix} \text{O} \\ \parallel \\ \text{Cl} \end{matrix} + \text{H}_2 \xrightarrow{\text{Pt}} \text{R}-\text{C}\begin{matrix} \text{O} \\ \parallel \\ \text{H} \end{matrix} + \text{HCl}$
141	Stefen ,1925 yil	Nitrillarni xlorid kislota SnCl₂ bilan qaytarib al'degidlar olinadi; $\text{R}-\text{C}\equiv\text{N} \xrightarrow[\text{-SnCl}_4]{\text{SnCl}_2\text{HCl}} \text{R}-\text{CH}=\text{NH} \xrightarrow[\text{-NH}_3]{\text{H}_2\text{O}, \text{H}^+} \text{R}-\text{C}\begin{matrix} \text{O} \\ \parallel \\ \text{H} \end{matrix}$
142	Paal-Knorr, 1885 yil	1,4 –dikarbonil birikmalarni ammiak yoki amin bilan qizdirib, almashingan pirollar olinadi; $\text{H}_3\text{C}-\text{CH}_2-\text{C}(=\text{O})-\text{CH}_2-\text{C}(=\text{O})-\text{CH}_3$ $\xrightarrow{\text{NH}_3}$ 2,5-dimetilpirrol $\xrightarrow[\Delta]{\text{P}_2\text{O}_5}$ 2,5-dimetilfuran $\xrightarrow{\text{P}_2\text{S}_5}$ 2,5-dimetiltiolen
143	Knorr 1884 yil	α -aminokarbonil birikmalarni β -ketoefir bilan kondensatsiyaga kiritilganda almashingan pirollar hosil bo'ladi; $\text{CH}_3\text{OOC}-\text{CH}(\text{NH}_2)-\text{C}(=\text{O})-\text{CH}_3 + \text{CH}_3\text{COOCH}_2-\text{C}(=\text{O})-\text{CH}_3 \xrightarrow{\text{CH}_3\text{COOH}} \text{H}_3\text{C}-\text{C}(\text{COOCH}_2\text{CH}_3)=\text{C}(\text{COOCH}_3)-\text{CH}(\text{NH}_2)-\text{CH}_3$
144	Anri	Al'degidlar va nitroparafintlardan nitrospirtlar olish; $\text{RCH}=\text{O} + \text{RCHNO}_2 \xrightarrow{\text{kat.}} \text{RCH}(\text{OH})-\text{CH}(\text{NO}_2)\text{R}$
145	Gel-Fol'gard-	Oz miqdordagi fosfor ishtirokida karbon kislotalar brom va xlor

	Zelinskiy	bilan reaksiyaga oson kirishib, α -galogenkarbon kislotalarni hosil qiladi; $\text{CH}_3\text{—CH}_2\text{—COOH} \xrightarrow[\text{-HBr}]{\text{Br}_2+\text{P}} \text{CH}_3\text{—}\overset{\text{Br}}{\text{CH}}\text{—COOH} \longrightarrow$ $\xrightarrow[\text{-HBr}]{\text{Br}_2+\text{P}} \text{CH}_3\text{—}\overset{\text{Br}}{\underset{\text{Br}}{\text{C}}}\text{—COOH} \longrightarrow \text{reaksiya bormaydi}$ Bu reaksiya fosfor ishtirok etmaganda sekin boradi. Fosfor brom bilan reaksiyaga kirishib PBr_3 ni hosil qiladi PBr_3 karbon kislotani uning anhidridiga aylantiradi. Bromangidrididagi α -vodorodlar esa bromga oson almashinadi ; $2\text{P} + 3\text{Br}_2 \longrightarrow 2\text{PBr}_3$ $\text{CH}_3\text{—CH}_2\text{—COOH} \xrightarrow[\text{-P(OH)}_3]{+\text{PBr}_3} \text{CH}_3\text{—CH}_2\text{—}\overset{\text{O}}{\underset{\text{Br}}{\text{C}}} \xrightarrow[\text{-HBr}]{+\text{Br}_2} \text{CH}_3\text{—}\overset{\text{Br}}{\text{CH}}\text{—}\overset{\text{O}}{\underset{\text{Br}}{\text{C}}}$ $\text{CH}_3\text{—}\overset{\text{Br}}{\text{CH}}\text{—}\overset{\text{O}}{\underset{\text{Br}}{\text{C}}} \xrightarrow[\text{-CH}_3\text{CH}_2\text{COBr}]{\text{CH}_3\text{CH}_2\text{COOH}} \text{CH}_3\text{—}\overset{\text{Br}}{\text{CH}}\text{—}\overset{\text{O}}{\underset{\text{OH}}{\text{C}}}$ Ajralib chiqqan $\text{CH}_3\text{CH}_2\text{COBr}$ jarayonni davom ettirib, brom mo'l olinsa α, α -dibrompropion kislota hosil bo'ladi; Xlorlash ham bromlashdek boradi lekin elektrofil xlorlash bilan bir vaqtda radikal xlorlash ham borishi mumkin. $\text{CH}_3\text{—CH}_2\text{—COOH} \begin{cases} \xrightarrow{\text{Cl}_2+\text{P}} \text{CH}_3\text{—}\overset{\text{Cl}}{\text{CH}}\text{—COOH} \\ \xrightarrow{\text{Cl}_2+\text{nur}} \begin{array}{c} \text{CH}_2\text{—CH}_2\text{—COOH} \\ \quad \\ \text{Cl} \quad + \\ \text{CH}_3\text{—CH—COOH} \\ \\ \text{Cl} \end{array} \end{cases}$
146	Braun- Uoker	Dikarbon kislotalar monoefirlari ishqoriy tuzlarining anodli avtokondensatsiyasi;[7-8] $2\text{ROOC}(\text{CH}_2)_n\text{COO}^- \xrightarrow[\text{etanol}]{-2e^-} \text{ROOC}(\text{CH}_2)_n\text{CH}_2\text{—CH}_2(\text{CH}_2)_n\text{COOR}$
147	Dikman, 1901 yil	Besh,olti va etti a'zoli halqali ketonlar tegishli dikarbon kislotalar murakkab efirlarining alkogolyatlar ta'sirida boradigan kondensatsiya natijasida hosil bo'ladi; $\begin{array}{c} \text{COOR} \\ \diagup \\ (\text{CH}_2)_n \\ \diagdown \\ \text{COOR} \end{array} \xrightarrow[\text{ROH}]{\text{RONa}} \begin{array}{c} \text{C=O} \\ \\ (\text{CH}_2)_n\text{—CHCOOR} \end{array}$ $\xrightarrow[2.\Delta]{1.\text{H}_2\text{O}^+} \begin{array}{c} \text{C=O} \\ \\ (\text{CH}_2)_{n-1} \end{array} \longrightarrow (\text{CH}_2)_{n-1}\text{—CH}_2 + \text{H}_2\text{O}$ $\xrightarrow[2.\text{-CO}_2]{1.\text{-ROH}}$
148	L.Klayzen	Etilsirka efirni natriy, natriy etilat yoki natriy amidi ishtirokida qizdirib, atsetosirka efir olish;

		$\text{H}_3\text{C}-\text{C}(=\text{O})-\text{O}-\text{C}_2\text{H}_5 + \text{H}-\text{H}_2\text{C}-\text{COOC}_2\text{H}_5 \xrightarrow[\text{C}_2\text{H}_5\text{OH}]{\text{C}_2\text{H}_5\text{ONa}, \Delta} \text{CH}_3-\text{C}(=\text{O})-\text{CH}_2-\text{C}(=\text{O})-\text{O}-\text{C}_2\text{H}_5$ $\text{O}^-\text{C}_2\text{H}_5 + \text{H}-\text{H}_2\text{C}-\text{COOC}_2\text{H}_5 \rightleftharpoons \text{:CH}-\text{COOC}_2\text{H}_5 + \text{C}_2\text{H}_5\text{OH}$ $\text{CH}_3-\text{C}(=\text{O})-\text{O}-\text{C}_2\text{H}_5 + \text{:CH}-\text{COOC}_2\text{H}_5 \rightleftharpoons \text{CH}_3-\text{C}(\text{O}^--\text{OC}_2\text{H}_5)-\text{CH}_2-\text{COOC}_2\text{H}_5$
149	Xensli-Prelog-Shtoll	Dikarbon kislotalar efirlarining natriy ta'sirida siklokondensatsiyasi (sikloketonlanish) natijasida makrosiklik atsiloinlar hosil bo'ladi; $\text{ROOC}(\text{CH}_2)_n\text{COOR} \xrightarrow[\text{n} \geq 7]{\text{Na}, \text{N}_2, \Delta} \text{O}=\text{C}-\underset{(\text{CH}_2)_n}{\text{CH}}-\text{OH}$
150	Buvo-Blan, 1903 yil	Karbon kislotalar murakkab efirlarini natriy metalini etanolda eritganda hosil bo'ladigan vodorod bilan qaytarganda spirtlar aralashmasi hosil bo'ladi; $\text{R}-\text{C}(=\text{O})-\text{OR}' + 4\text{Na} + 4\text{C}_2\text{H}_5\text{OH} \xrightarrow[\text{-4C}_2\text{H}_5\text{ONa}]{\text{C}_2\text{H}_5\text{OH}} \begin{cases} \text{R}-\text{CH}_2\text{OH} \\ \text{R}'-\text{OH} \end{cases}$
151	Krum-Braun va Uoker, 1891-1893 yillar	Dikarbon kislotalar monoefirlari(nordon efirlar) kaliyli tuzlarini elektroliz qilib, dikarbon kislotalar olish; $2\text{ROOC}(\text{CH}_2)_n\text{COOK}^{\ominus} \xrightarrow[\text{-CO}_2, \text{-KOH}, \text{-H}_2]{\text{H}_2\text{O}} \text{ROOC}(\text{CH}_2)_{2n}\text{COOR} \xrightarrow[\text{2ROH}]{\text{2H}_2\text{O}} \text{HOOC}(\text{CH}_2)_{2n}\text{COOH}$
152	Sherbul's, 1946 yil	Karbon kislotalarni mochevina bilan qizdirilganda yuqori unum bilan amidlar hosil bo'ladi; $\text{R}-\text{C}(=\text{O})-\text{OH} + \text{H}_2\text{N}-\text{C}(=\text{O})-\text{NH}_2 \xrightarrow[\text{-CO}_2, \text{-NH}]{\Delta} \text{R}-\text{C}(=\text{O})-\text{NH}_2$
153	Gofman, 1881 yil	Azot atomodagi vodorodlari almashinmagan amidlar natriy gipobromod (yoki o'yuvchi natriy eritmasidagi brom) bilan reaksiyaga kirishib bir atom kam tutgan aminlarga qayta guruhlanadi; $\text{R}-\text{C}(=\text{O})-\text{NH}_2 \xrightarrow[\text{-NaBr}, \text{-H}_2\text{O}]{\text{NaOBr}} \text{R}-\text{N}=\text{C}=\text{O} \xrightarrow[\text{-CO}_2]{\text{H}_2\text{O}} \text{R}-\text{NH}_2$
154	Rayt, 1968 yil	Gofman reaksiyasining quyidagi mexanizmini Rayt aniqladi; $\begin{aligned} &\text{R}-\text{C}(=\text{O})-\text{NH}_2 \xrightarrow[\text{-HBr}]{\text{Br}_2} \text{R}-\text{C}(=\text{O})-\text{NHBBr} \xrightarrow[\text{-H}_2\text{O}]{\text{OH}^{\ominus}} \text{R}-\text{C}^{\ominus}(\text{O})-\text{NHBBr} \longrightarrow \\ &\xrightarrow{\text{-Br}} \text{R}-\text{N}^{\ominus}-\text{C}=\text{O} \longleftrightarrow \text{R}-\text{N}=\text{C}=\text{O} \longleftrightarrow \\ &\longleftrightarrow \text{R}-\text{NH}-\text{C}(=\text{O})-\text{OH} \xrightarrow{\text{-CO}_2} \text{R}-\text{NH}_2 \end{aligned}$
155	Mixael	Malon efiri asosli katalizatorlar ishtirokida α, β-to'yingan

		kislotalarni hosilalarining qo'shbog'iga yoki $-\text{CN}, \text{NO}_2$ singsri elektronoakseptor orinbosarlar bilan faollashtirilgan qo'shboqqa nukleofil birikadi; $\text{C}_6\text{H}_5-\text{CH}=\text{CH}-\text{COOC}_2\text{H}_5 + \text{CH}(\text{COOC}_2\text{H}_5)_2 \xrightarrow{\text{C}_2\text{H}_5\text{ONa}}$ $\longrightarrow \text{C}_6\text{H}_5-\underset{\text{CH}(\text{COOC}_2\text{H}_5)_2}{\text{CH}}-\text{CH}_2-\text{COOC}_2\text{H}_5$ $\text{NO}_2-\underset{\text{R}}{\text{CH}}=\text{CH} + \text{CH}(\text{COOC}_2\text{H}_5)_2 \xrightarrow{\text{C}_2\text{H}_5\text{ONa}} \text{NO}_2-\text{CH}_2-\underset{\text{R}}{\text{CH}}-\text{CH}(\text{COOC}_2\text{H}_5)_2$
156	Lossen ,1875 yil	Gidrooksam kislotalat SOCl_2, P_2O_5 yoki sirka anhidrid ishtirokida birlamchi aminlarga qayta guruhlanadi; $\text{R}-\underset{\text{NHOH}}{\overset{\text{O}}{\text{C}}} \longrightarrow \text{R}-\text{NH}_2 + \text{CO}_2$
157	Buvo-Lokken	α -izonitroizoeifirlardan nitrozil ta'sirida sul'fat kislotasi α - ketoefirlar oilsh; $\text{RCCOOC}_2\text{H}_5 \xrightarrow{\text{ONOSO}_3\text{H}} \text{RCCOOC}_2\text{H}_5$ $\text{NOH} \qquad \qquad \qquad \text{O}$
158	Arntd-Eystert, 1927 yil	Diazometan karbon kislotalarning xlorangidridlari bilan reaksiyaga oson kirishib α -diazoketonlarni hosil qiladi; $\text{R}-\underset{\text{xlorangidrid}}{\overset{\text{O}}{\text{C}}}\text{Cl} + \underset{\text{diazometan}}{\text{CH}_2\text{N}_2} \longrightarrow \text{RC}-\underset{\alpha\text{-diazoketon}}{\overset{\ominus}{\text{CH}}}-\overset{\oplus}{\text{N}}=\text{N} + \text{CHCl}_3 + \text{N}_2 \uparrow$ Qaynash harorati yuqori bo'lgan erituvchilar (benzil spirt, 2-oktanol)da α -diazoketon qayta guruhlanadi. $\text{RC}-\overset{\ominus}{\text{CH}}-\overset{\oplus}{\text{N}}=\text{N} \longleftrightarrow \text{R}-\overset{\text{:}\ddot{\text{O}}\text{:}}{\overset{\ominus}{\text{C}}}=\text{CH}-\overset{\oplus}{\text{N}}=\text{N}$ 160-180°C haroratda kumush tuzlari ishtirokida alkilketonlar va azot hosil bo'ladi. $\text{R}-\overset{\text{O}}{\overset{\parallel}{\text{C}}}-\underset{\alpha\text{-diazoketon}}{\text{CH}}=\overset{\oplus}{\text{N}}=\overset{\ominus}{\text{N}} \xrightarrow{\text{Ag}^+} \text{R}-\underset{\text{alkilketon}}{\text{CH}}=\text{C}=\text{O} + \text{N}_2 \uparrow$ Alkilketon girolizidan karbon kislotasi hosil bo'ladi. $\text{R}-\underset{\text{alkilketon}}{\text{CH}}=\text{C}=\text{O} + \text{H}_2\text{O} \longrightarrow \text{R}-\underset{\text{karbon kislotasi}}{\text{CH}_2}-\overset{\text{O}}{\overset{\parallel}{\text{C}}}-\text{OH}$ Reaksiya Vol'f qayta guruhlanish asosida boradi (1912yil).
159	Shotten-Bauman,	Ishqorning suvdagi eritmasida aminlar va spirtlarni atsilxloridlar ta'sirida atsillash (N va O atsillash). $\text{N}-\text{H} + \text{RCOCl} \xrightarrow[\text{H}_2\text{O}]{(\text{KOH})} \text{N}-\text{COR}$
160	Pexman	Nitrozoaminlarning ishqoriy muhitda gidrolizi natijasida diazoalkenlar hosil bo'ladi; $\text{CH}-\underset{\text{R}}{\text{N}}-\text{NO} \xrightarrow[\text{(efir+suv)}]{(\text{KOH}), 0-5^\circ\text{C}} \text{CH}-\underset{\text{H}}{\text{N}}-\text{NO} \longleftrightarrow$

		$\rightleftharpoons \text{CH}=\text{N}=\text{NOH} \longrightarrow \text{C}=\text{N}=\text{N}^{\oplus}\text{N}^{\ominus}$ $\text{R}=\text{COOC}_2\text{H}_5, \text{CONH}_2$
161	Bamberger	Uchlamch alkilaminlarni oksidlash orqali nitroalkanlar olish; $\text{R}-\underset{\text{R}}{\overset{\text{R}}{\text{C}}}-\text{NH}_2 \xrightarrow{3\text{Q CF}_3\text{COO OH}} \text{R}-\underset{\text{R}}{\overset{\text{R}}{\text{C}}}-\text{NO}_2 + \text{H}_2\text{O}$
162	V.Meyer 1873 yil	Birlamchi nitroalkanlar yuqori haroratda ma'dan kislotalarning konsentrlangan eritmaları (masalan 85%H_2SO_4 yoki konsentrlangan HCl) ta'sirida gidrolizlanib karbon kislota va gidroksilaminning tuzini hosil qiladi; $\text{R}-\text{CH}_2-\text{NO}_2 + \text{H}_2\text{SO}_4 + \text{H}_2\text{O} \xrightarrow{\Delta} \text{R}-\text{COOH} + \left[\text{H}_3\text{NOH}^{\oplus} \right] \text{HSO}_4^{\ominus}$ Bu reaksiyada atsi-nitrobirikma gidroksam kislotaga qayta guruhlanadi ,so'ngra gidroksam kislota karbon kislota va gidroksilaminga gidrolizlanadi. $\text{R}-\text{CH}_2-\text{N}^{\oplus}(\text{O})=\text{O} \rightleftharpoons \text{R}-\text{CH}=\text{N}^{\oplus}(\text{OH})-\text{O} \xrightarrow{\text{H}^+} \left[\text{R}-\text{CH}=\text{N}^{\oplus}(\text{OH})-\text{O} \right] \longleftrightarrow$ $\text{R}-\text{C}(=\text{O})\text{NHOH} \xrightarrow[\text{H}_2\text{O}]{+\text{H}^+} \text{R}-\text{C}(=\text{O})\text{OH} + \text{NH}_2\text{OH}$ Bu reaksiya bilan sanoatda gidroksilamin va ba'zi karbon kislotalar olinadi.
163	X.Gess, 1930 yil	Sanoatda alkanlarni konsentrlangan nitrat kislota bilan gaz fazada nitrolab nitroalkanlar olinadi, alkan va nitrat kislotaning bug'i maxsus reaktorda 420-480°C haroratgacha juda qisqa vaqt(0.2-2 sekund)qizdiriladi va tez sovutiladi. Metan qiyin nitrolanadi. $\text{CH}_4 + \text{HNO}_3 \xrightarrow{475^\circ\text{C}, 0.2\text{sekund}} \text{CH}_3\text{NO}_2 + \text{H}_2\text{O}$ Etan , propan, butan va pentanni nitrolaganda C-C bog'i uzulib mononitroalkanlar hosil bo'ladi; $3\text{CH}_3-\text{CH}_2-\text{CH}_3 \xrightarrow[420^\circ\text{C}; 17\text{ sek}]{\text{HNO}_3} \begin{cases} \text{CH}_3-\text{NO}_2 \\ \text{CH}_3-\text{CH}_2-\text{NO}_2 \\ \text{CH}_3-\text{CH}_2-\text{CH}_2-\text{NO}_2 \\ \text{CH}_3-\underset{\text{CH}_3}{\text{CH}}-\text{NO}_2 \end{cases}$ Reaksiyon aralashmadan mononitroalkanlar haydash yo'li bilan ajratiladi;
164	Mixael	Birlamchi va ikkilamchi nitoalkanlar faol qo'shbg'i bor birikmalar bilan birikish reaksiyalariga kirishadi;

		$\text{R}_2\text{CH}(\text{NO}_2) + \text{CH}_2=\text{CH}-\text{EA} \longrightarrow \text{R}_2-\text{C}(\text{NO}_2)-\text{CH}_2-\text{CH}_2-\text{EA}$ EA-elektronoakseptor guruh. EA=-COOCH₃, -COCH₃, -CHO, -CN, -NO₂
165	Uchi	Imoniy tuzlari izonitrillar bilan reaksiyaga kirishganda uglerod-azot qo'shbog'i uziladi yangi birikish maxsuloti hosil bo'ladi; $\text{C}=\text{N}^+ + \text{B}^- + \text{RN}=\text{C} \longrightarrow \text{B}-\text{C}=\text{NR}$
166	Ritter	Nitrillar alkenlardan konsentrlangan sulfat kislotaga ta'sirida hosil bo'ladigan karbonat ionlar bilan reaksiyaga kirishganda uglerod-azot uchbog'iga birikish boradi. Reaksiya mahsuloti gidroliz qilinganda N-almashingan amidlar hosil bo'ladi; [4,7,9] $\text{RC}\equiv\text{N} + \text{C}^+-\text{C}(\text{H}) \longrightarrow \text{RC}=\text{N}-\text{C}(\text{H})$
167	Kaluza	Asoslar ta'sirida N-almashingan karboetoksidiokarbomatlarni izotio –sianatlarga aylanishi; $\text{RNHC}(=\text{S})-\text{SCOOC}_2\text{H}_5 \xrightarrow[\text{xloroform}]{\text{asos}} \text{RN}=\text{C}=\text{S}$
168	A.Gofman , 1849 yil	Galogenalkanlarni spirtli eritmasi ammiak bilan bosim ostida qizdirilganda aminlar aralashmasi hosil bo'ladi. Reaksiyaning birinchi bosqichida alkil guruhining ammiak azotiga birikishidan alkilammoniy tuzi hosil bo'ladi. Bu tuz ortiqcha ammiak ta'sirida alkilamin va ammoniygalogenidga parchalanadi. Alkilamin galogenalkan bilan reaksiyaga kirishib dialkilammoniy, trialkilammoniy va tetraalkilammoniy tuzlarini hosil qiladi. Ammiak mo'l miqdor olinganda asosan birlamchi amin hosil bo'ladi; $\begin{aligned} \text{R-X} + \text{NH}_3 &\longrightarrow \left[\text{RNH}_3^+ \right] \text{X}^- \xrightarrow{\text{NH}_3} \text{RNH}_2 + \text{NH}_4\text{X} \\ \text{RNH}_2 + \text{RX} &\longrightarrow \left[\text{R}_2\text{NH}_2^+ \right] \text{X}^- \xrightarrow{\text{NH}_3} \text{R}_2\text{NH} + \text{NH}_4\text{X} \\ \text{R}_2\text{NH} + \text{RX} &\longrightarrow \left[\text{R}_3\text{NH}^+ \right] \text{X}^- \xrightarrow{\text{NH}_3} \text{R}_3\text{NH} + \text{NH}_4\text{X} \\ \text{R}_3\text{N} + \text{RX} &\longrightarrow \left[\text{R}_4\text{N}^+ \right] \text{X}^- \end{aligned}$
169	A.Gofman, 1881yil	Birlamchi aminlar karbon kislotalarni ishqoriy muhitda brom bilan parchalab olinadi; $\text{R}-\text{C}(=\text{O})-\text{NH}_2 \xrightarrow{\text{Br}_2/\text{NaOH}, \Delta} \text{R}-\text{C}(=\text{O})-\text{N}(\text{H})\text{Br} \xrightarrow[\text{-H}(\text{H}_2\text{O})]{+\text{OH}^-} \left[\text{R}-\text{C}(=\text{O})-\text{N}(\text{H})-\text{Br} \right] \longrightarrow$

		$\xrightarrow[\text{-Br}]{\text{qayta guruhlanish}} \text{O}=\text{C}=\text{N}-\text{R} \xrightarrow[\text{izosianat}]{\text{H}_2\text{O}} \text{R}-\text{NH}_2 + \text{CO}_2$
170	A.Gofman, 1881yil	Tetrametilammoniy gidroksidi qizdirilganda trimetilamin va metanolga parchalanadi; $\begin{array}{c} \text{CH}_3 \\ \\ \text{H}_3\text{C}-\text{N}^+-\text{CH}_3 \\ \\ \text{CH}_3 \end{array} + \text{OH}^- \xrightarrow{\Delta} (\text{CH}_3)_3\text{N} + \text{CH}_3\text{OH}$ Uglerod radikallari murakkabroq tuzulgan to'rtlamchi ammoniy asoslarining Gofman bo'yicha parchalanishidan uchlamch amin, alken va suv hosil bo'ladi. $\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ \quad \quad \\ \text{H}_3\text{C}-\text{C}-\text{C}-\text{CH}_2 \\ \quad \\ \text{H} \quad \text{NR}_3 \end{array} \xrightarrow{\text{OH}^-, \Delta} \begin{array}{c} \text{H} \quad \text{H} \\ \diagdown \quad / \\ \text{C}=\text{C} \\ / \quad \diagdown \\ \text{H}_5\text{C}_2 \end{array} + \text{R}_3\text{N} + \text{H}_2\text{O}$ Bu reaksiya E_N2 mexanizm bo'yicha regeoselektiv boradi.
171	Meyzenxaymer-Kaup	Aminlarning N-oksidlari qizdirilganda almashingan gidroksilaminlar (Meyzenxaymer qayta guruhlanishi) yoki alkenlar (Kaup qayta guruhlanishi) hosil bo'ladi; [8-10] $\begin{array}{c} \text{R} \\ \\ \text{R}-\text{N}-\text{O}^- \\ \\ \text{R}' \end{array} \xrightarrow[\text{NaOH}]{80-165^\circ\text{C}} \begin{array}{c} \text{R} \\ \\ \text{R}-\text{N}-\text{O}-\text{R}' \\ \\ \text{R} \end{array}$ $\begin{array}{c} \text{R}_2\text{N}-\text{O}-\text{R}_2 \\ \\ \text{CH}_2\text{CH}_2 \end{array} \xrightarrow{80-150^\circ\text{C}} \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{R}_2\text{C} \quad \text{C} \\ \diagup \quad \diagdown \\ \text{CH}_2 \quad \text{NR}_2 \end{array} \longrightarrow \text{R}'_2\text{C}=\text{CH}_2 + \text{R}_2\text{NOH}$
172	Mannix , 1912 yil	Karbonil guruhi saqlagan aromatik birikmalarni kislotali muhitda aminometillash; $\begin{array}{c} \text{COCH}_3 \\ \\ \text{C}_6\text{H}_5 \end{array} + (\text{CH}_3)_2\text{NH}\cdot\text{HCl} + (\text{CH}_2\text{O})_n \xrightarrow[\text{etanol}]{\text{HCl}} \begin{array}{c} \text{COCH}_2\text{CH}_2\text{N}(\text{CH}_3)_2 \\ \\ \text{C}_6\text{H}_5 \end{array}$ atsetofenon dimetilamin gidroksid b.N,N-dimetilamino propiofenon
173	Darnov-Taydel	Ketonitrillardagi uglerod-uglerod bog'ini aminlar bilan parchalaganda karbon kislotalarining amidlari hosil bo'ladi; $\text{RC}-\text{C}\equiv\text{N} + \text{H}-\text{N} \begin{array}{c} \diagup \\ \diagdown \end{array} \xrightarrow[\text{erituvchi}]{\text{inert}} \text{RC}-\text{C}(=\text{O})-\text{N} \begin{array}{c} \diagup \\ \diagdown \end{array}$
174	Braun	Uchlamchi aminlarni sianbromid ta'sirida parchalash; $\text{R}_2\text{N}-\text{R}' + \text{BrCN} \xrightarrow[\text{erituvchi}]{\text{inert}} \begin{array}{l} \text{R}_2\text{N}-\text{CN} + \text{R}'\text{Br} \\ \text{RRN}-\text{CN} + \text{R}'\text{Br} \end{array}$
175	Granauskas	Polinitroalkanlarning tuzlarini fluorlash jarayoni 0-5° C haroratda suvli eritmada olib boriladi ; $\begin{array}{c} \text{R}-\text{C}-\text{NO}_2 \\ \\ \text{NO}_2 \end{array} \xrightarrow[\text{suv}]{\text{F}_2, 0-5^\circ\text{C}} \begin{array}{c} \text{R}-\text{C}-\text{NO}_2 \\ \\ \text{F} \end{array}$
176	V.Reppe	Metallarning karbonillari katalizatorligida alkinlar CO va H ₂ O

		bilan reaksiyaga kirishib α, β-to'ynmagan monokarbon kislotalarni hosil qiladi; $R-C\equiv C-R' \xrightarrow{H_2O, CO, Ni(CO)_4} R-CH=C(R')-COOH$
177	Overberger-Lombardin	1,2-difeniletan quyidagicha olinadi. $\begin{array}{c} \text{PhCH}_2 - \text{N} - \text{CH}_2\text{Ph} \\ \\ \text{NO} \end{array} \xrightarrow{\text{Na}_2\text{S}_2\text{O}_4} \text{PhCH}_2 - \text{CH}_2\text{Ph}$
178	Ipat'ev	1,4-Dibromalkenlarning natriymalon efiri bilan siklokondensatsiyasi natijasida almashingan siklopropanlar hosil bo'ladi; [7-10] $\begin{array}{c} \text{Br} - \text{CH} - \text{C} = \text{C} - \text{CH} - \text{Br} \\ \qquad \qquad \end{array} + \text{Na}^+ \text{CH}^-(\text{COOCH}_2\text{CH}_3)_2 \xrightarrow[\text{etanol}]{\Delta} \begin{array}{c} \text{---CH=C---C---C---COOCH}_2\text{CH}_3 \\ \qquad \qquad \qquad \qquad \\ \qquad \qquad \text{CH} \end{array}$
179	Dekker-Forster	Birlamchi aminlar al'degidlar bilan inert erituvchida qizdiriladi. So'ngra bu mahsulot galogenalkanlar bilan reaksiyaga kiritiladi. Oxirgi mahsulotning gidrolizidan ikkilamchi aninlar hosil bo'ladi; $R-NH_2 + R'CHO \xrightarrow[\text{inert erituvchi}]{\Delta} R-N=CHR' \xrightarrow[\Delta]{R''-X} R-N(R'')=CHR'$
180	Pinner	Iminoefirlar gidrogalogenidlarini alkogolizi natijasida ortoefirlar hosil bo'ladi; $\begin{array}{c} \text{---C=NH}\cdot\text{NX} \\ \\ \text{OR}^I \end{array} + 2\text{ROH} \longrightarrow \text{R}(\text{OR}^I)_3$
181	Pinner	Imino efirlar tuzlarining aminolizi natijasida amidinlar hosil bo'ladi; $\begin{array}{c} \text{---C=NH}\cdot\text{NX} \\ \\ \text{OR}^I \end{array} + \text{H}-\text{N} \begin{array}{l} \diagup \\ \diagdown \end{array} \longrightarrow \begin{array}{c} \text{RC=NH}\cdot\text{NX} \\ \\ \text{N} \begin{array}{l} \diagup \\ \diagdown \end{array} \end{array}$
182	Veerman	Aminoqandlar uglerod zanjirini oksidlab parchalash reaksiyasi orqali qisqartirish; $\begin{array}{c} \\ \text{CHO}-\text{H} \\ \\ \text{CHO}-\text{H} \\ \end{array}$ $\begin{array}{c} \text{CHO} \\ \\ \text{CHO}-\text{H} \\ \end{array}$
183	Ruff-Fenton	Vodorod peroksid va temir (III) tuzlari ta'sirida uglerod zanjiri bir atomga kamayadi.

		$ \begin{array}{ccc} \text{COO}^- & & \text{CHO} \\ & & \\ \text{CHOH} & \longrightarrow & \text{CHOH} \\ & & \\ \text{CHOH} & & \end{array} $
185	Berri	Oligo yoki polisaxaridlardagi gliko guruhlarini periodat bilan va atsetal guruhini fenilgidrazin bilan parchalash;
186	Val	Aldozalar uglerod zanjirini qisqartirish oksimlar va nitrillar hosil bo'lish bosqichi orqali amalga oshadi;
187	Lobri-De Bryuin-Eknshtayn	Aldozalar ishqoriy muhitda enol hosil bo'lish bosqichi bilan ketozalarga izomerlanadi;
188	Louri	Uglevodlarni bir vaqtning o'zida kislota-asos katalizi natijasida mutaratatsiyasi (eritmada birikmaning optik burilishini doimiy qiymatigacha o'zgarishi).[10]

189	Xeyuort	Monosaxaridlarni dimetilsil'fat bilan ishqorning suvdagi eritmasida metillash; $ \begin{array}{ccc} \begin{array}{c} \text{CHO—H} \\ \\ \text{CHO—H} \\ \\ \text{CHO—H} \end{array} & \xrightarrow[\text{(suv,NaOH)}]{\text{(CH}_3\text{)}_2\text{SO}_4, \text{N}_2} & \begin{array}{c} \text{CH —O—CH}_3 \\ \\ \text{CH —O—CH}_3 \\ \\ \text{CH —O—CH}_3 \end{array} \end{array} $
190	Purdi-Irvin	To'liq metillangan monosaxaridlarni olish uchun qisman metillangan monosaxaridlarga kumush oksidi ta'sirida metil iodid ta'sir ettiriladi;[7-10]

Xulosa

Kurs ish o'zbek va rus tillarida nashr qilingan darslik, o'quv qo'llanma va monografiyalardan hamda internet ma'lumotlaridan foydalanib, ochiq zanjirli organik birikmalar qatoridagi 190 ta olimlar nomi bilan yuritiladigan (nomdor) reaksiyalar umumlashtirildi. Bu nomdor reaksiyalarning kechish sharoiti, sxemalari yoki tenglamalarikeltirildi, muhim nomdor reaksiyalarning mexanizmlari bayon qilindi.

Foydalanilgan adabiyotlar

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