

DISCOVERY OF VARIOUS REACTION INTERMEDIATES IN ORGANIC CHEMISTRY

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Acylium Ions (oxocarbenium ions)

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Discovery of Reaction Intermediates

Discovery of Reaction Intermediates	
1867	Radical anions (Berthelot, M.)
1875	enols (Erlenmeyer, E./Meyer, K.H./Ingold, C.K.)
1879	Radical cations (Wurster, C.)
1880	Wallach intermediate
1899	carbocations (Stieglitz, J./Baeyer, A./Villiger, V./Norris, J.N.)
1900	carbon radicals (Gomberg, M.; Bachman, W.E.)
1902	Meisenheimer complexes (Meisenheimer, J.)
1907	carbanions (Zincke, T./Schiff, H./Wren, H./Tarbouriech, P.J.)
1907	ketenes (Staudinger, H.)
1907	o-xylylenes (Willstatter, R./Bamberger, E./Ipatiev, V./Tschitshibabin, A.E.)
1911	o-quinonemethides (Staudinger, H.)
1912	Carbenes (Staudinger, H.)
1913	nitrenium ions (Stieglitz, J./Gassman, P.G.)
1914	Radical anions (Schlenk, W./Willstaetter, R./Scott, N.D./Hueckel, W.)

1917	nitrenes (Tiemann, X.; Staudinger, H.)
1920	Hydronium ion (Bagster, L.S./Cooling, G./Volmer, M.)
1921	ketyl radicals (Hantzsch, A./Gomberg, M./Bachman, W.E.)
1926	tetrahedral intermediates (Swarts, F./ Helferich, B./ Bender, M.L.)
1928	biradicals (Wittig, G./Schonberg, A./Muller, A.)
1930	ynols (Hurd, C.D.)
1932	iminium ions (Stewart, T.D./Bradley, W.E./Julg, A./Carles, P.)
1935	vinylidene (Emschwiller, G.)
1936	ylides (Wittig, G.)
1937	Oxonium ions (Meerwein, H.)
1942	Wheland intermediates (Wheland, G.)
1945	triplet ketones (Lewis, G.N./Kasha, M.)
1946	nitronium ions (Hughes, E.D./Ingold, C.K.)
1949	phenonium ions (Cram, D.J.)
1949	Non-classical ions (Winstein, S./Roberts, J.D.)
1951	halonium ions (Barton, D.H.R./Lemieux, R.U./Olah, G.A.)
1952	nitrosonium ions (Hughes, E.D./Ingold, C.K.)
1952	Aromatic sigma and pi complexes (Brown, H.C.)
1953	benzyne (Roberts, J.D.)
1954	betaines (Wittig, G.)
1954	Tropylium ion (Doering, W.v.E.)
1955	acylium ions (Burton, H./Prail, P.F.G./Bender, M.L.)
1956	nitrilium ions (Klages, F./Grill, W./Ugi, I./Hassner, A.)
1958	phenyl cations (Lewis, E.S.)
1960	triplet carbenes
1961	singlet carbenes
1963	vinyl cation (Peterson, P.E.)
1964	oxirene (McDonald, R.N./Schwab, P.A./Stille, J.K.)
1966	silylenes (Gaspar, P.P./Atwell, W.H.)
1985	Bertrand carbene
1991	Arduengo carbene

