

Organic Seminar

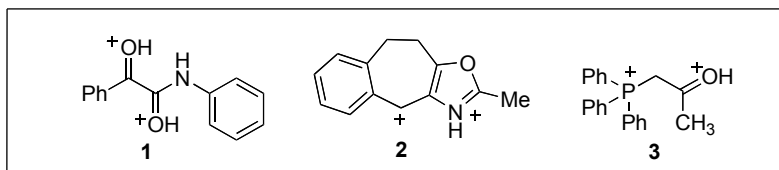
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Tuesday, October 6, 2009
3:30 p.m.
Room 1315 Chemistry



New Chemistry with Superelectrophiles

Electrophiles are chemical species that are attracted to regions of high electron density or negative charge. This chemistry is often due to positive charge on the electrophilic species. With the utilization of extremely strong acid systems (superacids), it has become possible to generate reactive electrophilic intermediates having two or more positive charges. These types of highly reactive species are often called superelectrophiles (**1-3**). Due to the high reactivities of superelectrophiles, they often have unusual and novel chemistry. Superelectrophiles have been observed in gas-phase studies and in the condensed phase. They have also been proposed in at least one biological process.



In this lecture, I will summarize several of our recent studies in the area of superelectrophilic chemistry. These studies include new synthetic methods to prepare heterocyclic systems, aza-polycyclic aromatic compounds, and other products. Mechanistic studies will also be presented, including chemistry involving single electron transfer to superelectrophiles. Recent work from our group has also shown that charge destabilization in superelectrophiles can be used as powerful control element in organic reactions, as we have demonstrated chemoselectivity, regioselectivity, and stereoselectivity, in the reactions of destabilized cationic species. This work will also be presented.