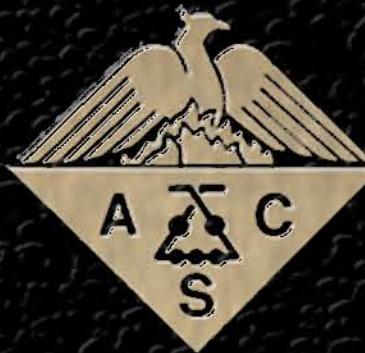




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Pearson, R. G. *J. Am. Chem. Soc.* 1963, 85, 3533-3539.

Hard and Soft Acids and Bases

By RALPH G. PEARSON

In a recent publication¹ the rate data for the generalized nucleophilic displacement reaction were reviewed and analyzed.



In this paper the equilibrium constants of eq. 1 will be considered, instead of the rates.



TABLE I
CLASSIFICATION OF LEWIS ACIDS

Class (a) or hard

H⁺, Li⁺, Na⁺, K⁺
Be²⁺, Mg²⁺, Ca²⁺, Sr²⁺, Sn²⁺
Al³⁺, Sc³⁺, Ga³⁺, In³⁺, La³⁺
Cr³⁺, Co³⁺, Fe³⁺, As³⁺, Ir³⁺
Si⁴⁺, Ti⁴⁺, Zr⁴⁺, Th⁴⁺, Pu⁴⁺,
VO²⁺
UO₂²⁺, (CH₃)₂Sn²⁺
BeMe₂, BF₃, BCl₃, B(OR)₃
Al(CH₃)₃, Ga(CH₃)₃, In-(CH₃)₃
RPO₂⁺, ROPO₂⁺
RSO₂⁺, ROSO₂⁺, SO₃⁻
I⁷⁺, I⁵⁺, Cl⁷⁺
R₃C⁺, RCO⁺, CO₂, NC⁺
HX (hydrogen bonding molecules)

Class (b) or soft

Cu⁺, Ag⁺, Au⁺, Tl⁺, Hg⁺,
Cs⁺
Pd²⁺, Cd²⁺, Pt²⁺, Hg²⁺,
CH₃Hg⁺
Tl³⁺, Tl(CH₃)₂, BH₃
RS⁺, RSe⁺, RTe⁺
I⁺, Br⁺, HO⁺, RO⁺
I₂, Br₂, ICN, etc.
Trinitrobenzene, etc.
Chloranil, quinones, etc.
Tetracyanoethylene, etc.
O, Cl, Br, I, R₃C(?)
M⁰ (metal atoms)
Bulk metals

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