

**LIEBIG TREE #2**

**Liebig condenser**

**Carl Schmidt**  
(Giessen, 1844)

**Ostwald dilution law (1888)**  
concept of catalysis (1894)  
rates of chemical reactions; chemical equilibrium

**Arthur A. Noyes**  
(Leipzig, 1890)

**John L.R. Morgan**  
(Leipzig, 1895)

**Georg Bredig**  
(Leipzig, 1894)

**Walden**  
inversion  
rule (1893)

**Robert T.D. Luther**  
(Leipzig, 1896)

**Roscoe G. Dickinson**  
(Cal Tech, 1920)

**Ward V. Evans**  
(Columbia, 1916)

**Evans-Polanyi relationship (1938)**  
**Bell-Evans-Polanyi principle (1936/8)**

**William C. Bray**  
(Leipzig, 1905)

**Beckman pH meter**  
(1935)

**Linus Pauling**  
**Pauling** electronegativity scale;  
hybridization concept in  
chemical bonding; structure  
of alpha helix in proteins;  
co-ordination theory of crystal structures

**Pearson's HSAB**  
principle (1963)

**Ernest Warhurst**  
(Manchester, 1930's)

**Eugene Wigner**  
discovery and application  
of fundamental symmetry  
principles to atomic nuclei  
and elementary particles  
**Wigner spin rules (1926/7)**

**Henry Taube**  
concept of ligand  
substitution reactions  
of co-ordination  
complexes (1952)

**John Charles Polanyi**  
infrared chemiluminescence;  
chemical lasers

**Edgar B. Wilson, Jr.**  
(Cal Tech, 1933)

**Karplus equation**  
(1959)

**William N. Lipscomb, Jr.**  
borane chemistry

**Dudley H. Herschbach**  
collision dynamics of elementary  
chemical reactions

**Woodward-Hoffman rules**  
(1965); concept of  
conservation of orbital symmetry

**John Bardeen**  
semiconductors and transistor  
effect (1948); BCS theory of  
superconductivity

**Shannon-Jaynes**  
function (19??)

**John Robert Schrieffer**  
theory of superconductivity  
(BCS theory)