Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Electron affinities of nucleobases, glycine and their complexes[1] ED S. CHEN, Baylor College of Medicine, EDWARD C. CHEN, The Wentworth Foundation — The electron affinities of adnenine, guanine, and the amino acids except for glycine have not been measured in the gas phase. New valence state electron affinities of the subject molecules are reported from reduction potentials and literature anion photoelectron spectra. These are supported by quantum mechanical calculations. Multiple negative ion potential energy curves are calculated to consolidate reduction potentials, electron impact spectra in helium nanodroplets, negative ion mass spectra, electron transmission spectra, electron spin resonance data for DNA, A method of measuring negative valence state electron affinities using ESR data is proposed. The adiabatic electron affinities are: in eV Adenine, 1.08(5), Guanine, 1.65(10), Cytosine, 1.04(5), Thymine, 0.98(5), Uracil, 0.99(5), Glycine, 0.50(5) Adenine: thymine 1.40(5) eV. Excited dipole bound and valence state electron affinities are also identified.

[1]The Wentworth Foundation

Ed S. Chen
Baylor College of Medicine

Date submitted: 29 Nov 2007 Electronic form version 1.4