

Preparation and Electrochemistry of Atomic Metal Electrodes

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Method for preparation of electrodes consisting of atomic metal and polyaniline has been developed. In this case un-capped clusters of pure metals Au_N , Pd_N and metal alloys Au_NPd_M (for N and M 0 to 8 atoms) are deposited in PANI, which serves as isolation matrix. The ionization energy of the clusters of such atomic size exhibits a characteristic “odd-even” variation in excess of 2eV for Au_N , which is governed by the quantum mechanical pairing of free electrons in the metal. Electrooxidation of lower aliphatic alcohols in strongly alkaline medium, as well as infrared spectra of the composite follow the theoretical pattern and confirm the existence of atomic moieties.