P-21 Sewall Hall 415

TIME-RESOLVED REFLECTANCE SPECTROSCOPY ON COMPOSITE BIOLOGICAL TISSUES*

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In many biomedical applications that use light as a diagnostic tool, data analysis is complicated by the heterogeneous composition of the tissue under investigation. An example is the assessment of the blood oxygenation in the brain. There are two major problems concerning these measurements: First, the brain is encapsulated by several layers of different tissues (skin, skull, meninges). Secondly, the blood, as the major absorber in the brain, is localized in blood vessels and takes up only a fraction of the total brain volume. The goal of this study is to quantify the influence of optically different layers and blood vessels on the time resolved photon migration in tissues. This leads to a quantitative interpretation of blood oxygenation measurements by time resolved reflectance spectroscopy. *In vivo* measurements on different parts of the head are compared with measurements on phantoms made from gels and resin, Monte Carlo simulations, and diffusion theory.

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SESSION III: Materials
Sewall Hall 301

III-1 2:00 p.m.-2:10 p.m.

LDA CALCULATION OF THE ELECTRONIC STRUCTURE OF $Ga_5As_5^+$ CLUSTER

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Electronic structure calculation of positively charged clusters, as opposed to neutral clusters, is relevant, since it facilitates a more meaningful comparison with experimental results obtained by spectroscopic analyses. The electronic structure of the $Ga_5As_5^+$ cluster is calculated using the Local Density Approximation method. Equilibrium geometries of the cluster are obtained by total energy minimization procedure. The results obtained using the two competing structures (tetracapped trigonal prism, TTP, and tetracapped octahedral, TO) of Ga_5As_5 neutral cluster are consistent.