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## Hemoglobin Concentration Studied by Spr Technique

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The advances of method for optical blood analysis need to know the properties of dispersion and absorption of human blood. It is also important for the diagnosis and prognosis of human therapeutic and applications in the field of medical laser, hematology, and the current medical diagnostic. The information on optical properties of human blood is fundamental for many medical applications. In particular, the hemoglobin in red blood cells plays an important role by transporting oxygen throughout the human body. The optical properties of the blood may be described by the intrinsic optical parameters: absorption coefficient, scattering coefficient, which they depends on the complex refractive index ( $n$ ). Because in the visible range is sensitive to the hemoglobin concentration, optical investigations of hemoglobin are important for medical diagnostics and treatment.

A simple method for determining the optical properties of oxyhemoglobin in human blood is proposed. The method is based on a variation of the complex propagation constant of guided wave in a thin-film optical waveguide. We present an optical sensor based on Surface Plasmon Resonance and study the variation of reflectivity of hemoglobin with deference concentration and in various wavelengths.

Figure below plots the real part of complex refractive index,  $n_r$  and extinction coefficient,  $k$ , respectively, versus wavelength,  $\lambda$  for various hemoglobin concentrations.

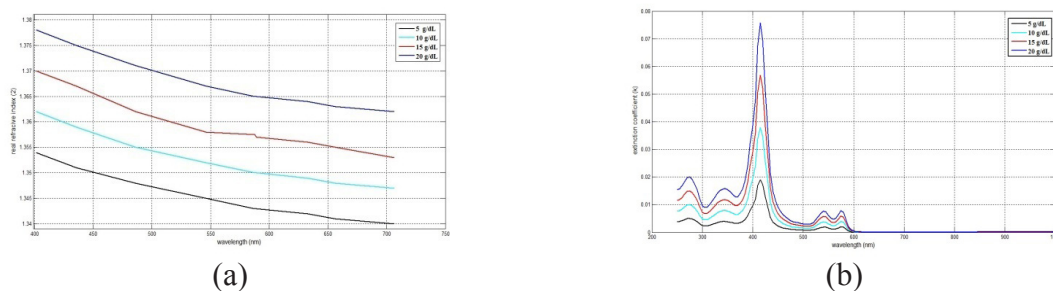


Figure 1 : (a) real part of hemoglobin refractive index, (b) imaginary part of hemoglobin refractive index