Modeling the optical properties of metallic nanoparticles

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We present the theoretical models for the optical properties of metallic nanoparticles. Optical absorption and scattering efficiency, and transmission and reflection coefficient of a single metallic nanoparticle are analytically calculated by Mie theory while those of a random assembly of nanoparticles are investigated by the effective medium theory. Via these models promising applications of metallic nanoparticles in enhancing light emission and absorption are discussed.