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Bulk Modulus of Spherical Palladium Nanoparticles by Chen-Mobius Lattice Inversion Method[1] ESAM ABDUL-HAFIDH, Yanbu University College — Palladium is a precious and rare element that belongs to the Platinum group metals (PGMS) with the lowest density and melting point. Numerous uses of Pd in dentistry, medicine and industrial applications attracted considerable investment. Preparation and characterization of palladium nanoparticles have been conducted by many researchers, but very little effort has taken place on the study of Pd physical properties, such as, mechanical, optical, and electrical. In this study, Chen-Mobius lattice inversion method is used to calculate the cohesive energy and modulus of palladium. The method was employed to calculate the cohesive energy by summing over all pairs of atoms within palladium spherical nanoparticles. The modulus is derived from the cohesive energy curve as a function of particles' sizes. The cohesive energy has been calculated using the potential energy function proposed by (Rose et al., 1981). The results are found to be comparable with previous predictions of metallic nanoparticles.

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