ABSTRACT

The pressure variations of the elastic constants of the constituent phases of dental amalgam (γ-Ag_3Sn, γ_1-Ag_2Hg_3 and γ_2-$HgSn_{7-8}$) were investigated in the 0-50 kilobar range. The velocities of propagation of longitudinal and transverse ultrasonic waves were measured using an ultrasonic interferometer and a solid media pressure apparatus. Computer analysis yields the pressure dependence of the bulk modulus, shear modulus, Young's modulus and Poisson's ratio; atmospheric pressure values are obtained by back extrapolation from the high pressure measurements. The values of these elastic constants are related to the crystallographic structures of the individual alloys. The possibility of high pressure, first order polymorphic transitions in γ and γ_2, is also discussed.