The author describes the principle and the method of measuring the elasticity and shear moduli of various temperatures, ranging from 0 to 800°C, of four ceramic metals: TiC+20%Co, TiC+20%MnCr, TiC+40%MnCr, Cr3C2+15%Ni+2%C, and of steel ЭИ 347 (EI347). The measuring instrument "Elastomat" is employed to measure the frequency of natural vibration of the samples, energized mechanically (piezo-electrical system) or electromagnetically (electromagnetic system). Knowing the frequency of natural vibration and applying the usual formulas of the theory of elasticity, constants $E$ and $G$ are calculated and plotted. There are 3 figures.