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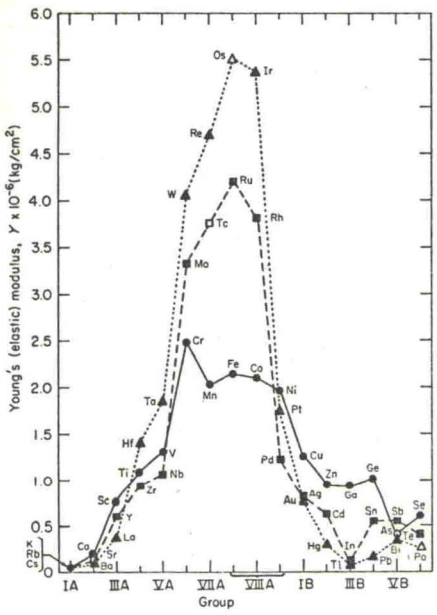

FIG. 1. Young's modulus of the elements of the fourth, fifth, and sixth periods of the Periodic Table. Open points are estimated values.

in many of their physical properties and in their alloying behaviors. Although the values for the elements in the second and third periods are not shown in Fig. 1, Young's modulus increases as one proceeds from lithium to beryllium to boron (or sodium to magnesium to aluminum) and

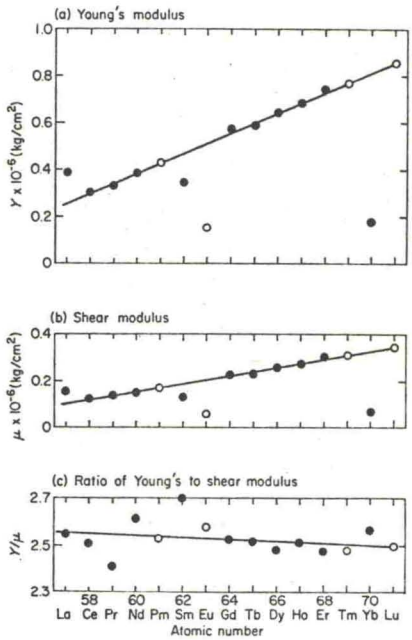

FIG. 2. (a) Young's modulus of the rare-earth metals. (b) Shear modulus of the rare-earth metals. (c) The ratio of Young's modulus to the shear modulus of the rare-earth metals. Open points are estimated values.

decreases on going from silicon to sulfur, in a manner similar to that shown for the corresponding elements of the fourth, fifth, and sixth periods.

The variation of Young's modulus for the rare earths lanthanum (atomic number 57) through lutetium (atomic number 71) is shown in Fig. 2a. The points for lanthanum, samarium, and ytterbium were ignored in drawing the straight line. The value for ytterbium is low because that element is divalent in the metallic state while the other rare earths are normally trivalent in the metallic state; but there seems to be no simple explanation for the lesser deviations of the values for lanthanum and samarium.

Selenium. Although the value listed here for Young's modulus for selenium appears to be reasonable when compared with the data shown in Fig. 1, if one uses it and the bulk modulus given in Table V, which