and

$$dG_V/dp = f_3(dc_{\mu\nu}/dp) \tag{4a}$$

and

$$dG_R/dp = f_4(dc_{\mu\nu}/dp)\,; \tag{4b}$$

where f_1 through f_4 are some linear combinations of the single-crystal elastic constants and their pressure derivatives, and they depend upon the crystal symmetry. The rigorous expressions for Eqs. (3) and (4) depend, therefore, on the symmetry of crystal in question; in the following, the expressions for cubic, hexagonal, trigonal, and tetragonal crystals are presented under each heading.

(a) *Cubic Crystals*:

$$dK_V/dp = dK_R/dp = dK^*/dp = dc_{11}/dp - \tfrac{2}{3}(dC_a/dp), \tag{5}$$

$$dG_V/dp = \tfrac{1}{5}(dC_a/dp) + \tfrac{3}{5}(dc_{44}/dp), \tag{6}$$

and

$$dG_R/dp = \tfrac{4}{5}(G_R/C_a)^2(dC_a/dp) + \tfrac{3}{5}(G_R/c_{44})^2(dc_{44}/dp), \tag{7}$$

where

$$C_a = (c_{11} - c_{12})$$

and

$$G_R = (5C_a c_{44})/(3C_a + 4c_{44}).$$

(b) *Hexagonal Crystals*:

$$dK_V/dp = \tfrac{1}{9}[2(dc_{11}/dp + dc_{12}/dp) + dc_{33}/dp + 4(dc/dp)], \tag{8}$$

and

$$dK_R/dp = C_b(K_R/C_c)^2(dC_c/dp) - (K_R^2/C_c)(dC_b/dp), \tag{9}$$

where

$$K_R = C_c/C_b, \tag{10}$$

where

$$C_b = c_{11} + c_{12} + 2c_{33} - 4c_{13}$$

and

$$C_c = c_{33}(c_{11} + c_{12}) - 2c_{13}^2.$$

$$dG_V/dp = (1/30)[dC_b/dp + 12(dc_{44}/dp) + 12(dc_{66}/dp)], \tag{11}$$

and

$$dG_R/dp = \tfrac{1}{5}[6K_V(G_R/C_c)^2(dC_c/dp) - 6(G_R^2/C_c)(dK_V/dp) + 2(G_R/C_a)^2(dC_a/dp) + 2(G_R/c_{44})^2(dc_{44}/dp) + (G_R/c_{66})^2(dc_{66}/dp)], \tag{12}$$

where

$$K_V = \tfrac{1}{9}[2(c_{11} + c_{12}) + c_{33} + 4c_{13}], \tag{13}$$

and

$$G_R = \tfrac{5}{2}[C_d/C_e], \tag{14}$$

where

$$C_d = C_c c_{44} c_{66}$$

and

$$C_e = C_c(c_{44} + c_{66}) + 3K_V c_{44} c_{66}.$$

(c) *Trigonal Crystals*:

$$dK_V/dp = \text{Eq. (8)}, \tag{15}$$

$$dK_R/dp = \text{Eq. (9)}, \tag{16}$$

and

$$dG_V/dp = \text{Eq. (11)}. \tag{17}$$

$$dG_R/dp = \tfrac{2}{5}(G_R/C_h)^2[(C_a + 2c_{44})dC_h/dp] - \tfrac{2}{5}(G_R^2/C_h)[dC_a/dp + 2(dc_{44}/dp)] + \tfrac{6}{5}[K_V(G_R/C_c)^2(dC_c/dp) - (G_R/C_c)(dK_V/dp)], \tag{18}$$

where

$$G_R = \tfrac{5}{2}[C_f/C_g], \tag{19}$$

where

$$C_f = C_c(c_{44}c_{66} - c_{14}^2)$$

and

$$C_g = C_c(c_{44} + c_{66}) + 3K_V(c_{44}c_{66} - c_{14}^2),$$