$$\frac{\partial \sigma_p}{\partial x_a} = 0 \qquad \sigma_p = \left[x_a^2 \sigma_a^2 + (1-x_a)^2 \sigma_B^2 + 2x_A(1-x_a)\sigma_a \sigma_B \rho_{ab}\right]^{\frac{1}{2}}$$

$$\frac{\partial \sigma_p}{\partial x_a} = \left(\frac{1}{2}\right) \frac{1}{\left[x_a^2 \sigma_a^2 + (1-x_a)^2 \sigma_B^2 + 2x_A(1-x_a)\sigma_a \sigma_B \rho_{ab}\right]^{\frac{1}{2}}} \times$$

$$\times \left[2x_a\sigma_a^2 + 2(1-x_a)\cdot(-1)\cdot\sigma_B^2 + (2x_A - 2x_A^2)'\sigma_a\sigma_B\rho_{ab}\right]$$

$$\frac{\partial \sigma_p}{\partial x_a} = \frac{1}{2} \frac{1}{\left[x_a^2 \sigma_a^2 + (1-x_a)^2 \sigma_B^2 + 2x_a(1-x_a)\sigma_a \sigma_B \rho_{ab}\right]^{\frac{1}{2}}} \times$$

$$\times \left[2x_a\sigma_a^2 - 2\sigma_B^2(1-x_a) + [2-4x_a]\sigma_a\sigma_B\rho_{ab}\right]$$

$$\sigma_p' = \ldots\ldots \times \left[2x_a\sigma_a^2 - 2\sigma_B^2 + 2x_a\sigma_B^2 + 2\sigma_a\sigma_B\rho_{ab} - 4x_a\sigma_a\sigma_B\rho_{ab}\right]$$

$$\sigma_p' = \frac{1}{2} \frac{\left[2x_a\sigma_a^2 - 2\sigma_B^2 + 2x_a\sigma_B^2 + 2\sigma_a\sigma_B\rho_{ab} - 4x_a\sigma_a\sigma_B\rho_{ab}\right]}{\left[x_a^2\sigma_a^2 + (1-x_a)^2\sigma_B^2 + 2x_a(1-x_a)\sigma_a\sigma_B\rho_{ab}\right]^{\frac{1}{2}}} = 0$$

$$x_a\left[2\sigma_a^2 + 2\sigma_B^2 - 4\sigma_a\sigma_B\rho_{ab}\right] = 2\sigma_B^2 - 2\sigma_a\sigma_B\rho_{ab}$$

$$x_a = \frac{\cancel{2}\sigma_B^2 - \cancel{2}\sigma_a\sigma_B\rho_{ab}}{\cancel{2}\sigma_a^2 + 2\sigma_b^2 - \cancel{4}\sigma_a\sigma_B\rho_{ab}}$$

$$\boxed{x_a = \frac{\sigma_B^2 - \sigma_a\sigma_B\rho_{ab}}{\sigma_a^2 + \sigma_B^2 - 2\sigma_a\sigma_B\rho_{ab}}}$$