Answer on Question #84240 – Chemistry – General Chemistry
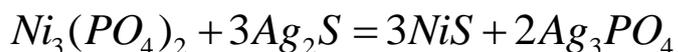
Task:

Complete and balance the following equation: $Ni_3(PO_4)_2 + Ag_2S$.

Solution:

Potential chemical reaction equation:

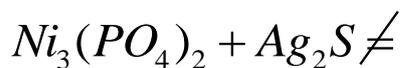$$Ni_3(PO_4)_2 + 3Ag_2S = 3NiS + 2Ag_3PO_4$$

BUT!!!

$$K_s(Ag_2S) = 2.0*10^{-50} << K_s(Ag_3PO_4) = 1.3*10^{-20};$$
$$K_s(Ni_3(PO_4)_2) = 5.0*10^{-32} << K_s(\alpha NiS) = 3.2*10^{-19}$$

The smaller the K_s, the less soluble the compound.

Therefore, a **chemical reaction does not proceed**.

$$Ni_3(PO_4)_2 + Ag_2S \neq$$