The mineral occurs in the iron meteorites: Butler (holotype specimen), Canyon Diablo, Carlton, Edmonton (Kentucky), Kenton County, Lenarto, Monahans, Oktibeha County, in the carbonaceous chondrite Efremovka and in the unnamed Ni-rich ataxite (Aldan river, 1997). In the Butler iron nickelphospide is found as: (1) idiomorphous isometric grains up to 30 μm in microscopic kamacite lamellae, growing up on the kamacite-taenite phase boundary; (2) xenomorphous, in general elongated inclusions up to 200 μm long at the larger kamacite spindles. In reflected light the mineral white with pink-yellow tint. Anisotropy: none observed in air, weak in yellowish-pinkish colours (oil, n = 1.515). $R_{\text{max}}/R_{\text{min}} (\lambda)$ in air (%): 43.0/41.6 (440), 43.9/42.3 (460), 44.6/43.0 (480), 45.5/43.7 (500), 46.5/44.7 (520), 47.5/45.7 (540), 48.3/46.8 (560), 49.1/47.6 (580), 50.0/48.6 (600), 50.7/49.4 (620), 51.7/50.3 (640), 52.5/51.3 (660), 53.3/52.1 (680), 54.3/53.1 (700). $\text{VHN} (\text{load } 25 \text{ g})$ 841–905 kg/mm$^2$, mean 874 kg/mm$^2$. Very brittle. D (calc.) 7.61(4) g/cm$^3$. Cleavage none observed. Chemical composition (wt %), type 1/type 2: Fe 33.4/35.5; Ni 52.9/49.6; Co 0.0/0.2; P 14.6/15.3; Ge 0.0/0.0; Total 100.9/100.6. Empirical formula based on 4 atoms per unit: type 1 — (Ni$_{1.83}$Fe$_{1.21}$)$_3$P$_{0.96}$; type 2 — (Ni$_{1.77}$Fe$_{1.28}$Co$_{0.01}$)$_3$P$_{1.00}$. Simplified formula: (Ni, Fe)$_3$P. Tetragonal, $\text{a} = 8.99(1)$, $c = 4.396 (7)$, $V = 355 (2)$Å$^3$, $Z = 8$. Strongest lines of X-ray powder pattern $d (I) (hkl)$: 2.48 (2) (031), 2.17 (10) (231), 2.13 (5) (330), 2.08 (5) (112), 2.01 (2) (240), 1.955 (7) (141), 1.803 (1) (222). The name is for the main constituents of chemical composition.