https://doi.org/10.46861/bmp.32.045 PŮVODNÍ PRÁCE/ORIGINAL PAPER

An intermediate member of the scorodite - strengite series, scorodite$_{56}$ - strengite$_{41}$, from Kutná hora ore district, Czech Republic: chemistry and X-ray powder diffraction study

Richard Pažout* and Jaroslav Maixner

University of Chemistry and Technology Prague, Technická 5, 166 28 Praha 6, Czech Republic;
**email: richard.pazout@vscht.cz*

Pažout R, Meixner J (2024) An intermediate member of the scorodite - strengite series, scorodite$_{56}$ - strengite$_{41}$, from Kutná hora ore district, Czech Republic: chemistry and X-ray powder diffraction study. Bull Mineral Petrolog 32(1): 45-49 ISSN 2570-7337

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A rare intermediate member of the scorodite - strengite series with an extraordinarily high degree of the anionic P for As substitution, technically a scorodite extremely rich in phosporus, scorodite$_{56}$ - strengite$_{41}$ (Scd$_{56}$ - Stg$_{41}$), was found and identified from mine dump material of the Rejzské pásmo Lode of the Kutná Hora ore district, Czech Republic. The mineral forms fine-grained, light brownish yellow crystalline masses and coatings, several milimeters in thickness on areas of tens of cm^2 on the surface of drusy quartz gangue with partially corroded galena and arsenopyrite. Chemical analyses revealed substantial amount of anionic phosphorus substituting for arsenic, ranging from 39.0 to 44.1 at. % of P (mean 41.0 %). Its chemical composition (mean of nine point analyses) corresponds to the empirical formula $(Fe^{3+}_{0.93}Al_{0.03}Pb_{0.01})_{\Sigma 0.97}[(As_{0.56}P_{0.41}S_{0.03})_{\Sigma 1.00}O_{4.00}]\cdot 2H_2O$. Such a scope of the P for As substitution in members of the scorodite - strengite series is rare and exceptional. X-ray powder diffraction data, unit-cell parameters and space group for the intermediate member are reported [*a* = 8.844(2) Å, *b* = 9.969(2) Å, *c* = 10.247(2) Å, unit-cell volume *V* = 903.39 Å^3, Z = 8 and space group *Pbca*]. No discontinuation of the solid solution between scorodite and strengite has been observed, X-ray powder difraction analysis unambiguously confirmed the existence of a single phase representing an intermediate member.

***Key words**: intermediate member, scorodite - strengite series, chemical composition, As - P substitution, indexed X-ray powder diffraction data, Kutná Hora ore district, Czech Republic*

Received 28. 4. 2024; accepted 25. 6. 2024