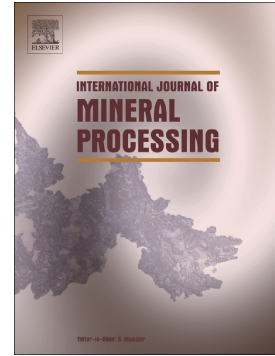


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INFLUENCE OF POLYMER POWDER ON PROPERTIES OF CEMENTED PASTE**BACKFILL**

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Abstract

This study investigates the influence of ethylene-vinyl acetate/vinyl ester of versatic acid (EVA/VE), a redispersible polymer powder, on the mechanical, chemical, and microstructural properties of sulfidic and non-sulfidic cemented paste backfill (CPB). Different EVA/VE amounts (7.5 to 20 wt% of cement mass) are examined in CPB mixtures. To assess the influence of EVA/VE on the CPBs consistency (fresh state), slump height was measured using a small Abram's cone. Uniaxial compressive strength (UCS) testing was conducted to determine the influence of polymer powder on the mechanical strength development of CPBs, and mercury intrusion porosimetry (MIP), scanning electron microscopy (SEM), and differential thermogravimetric analysis (DTG) were used to determine the influence of polymer powder on the microstructure and mineralogy of hardened CPBs. The achieved results implicated the dependency of polymer powder effectiveness on the tailings type. Of the different polymer powder proportions used in this study, the addition of 15% EVA/VE (based on the mass of binder) was only effective in improving UCS values of sulfidic tailings. The MIP, DTG, and SEM results also indicate that the addition of 15% polymer powder was beneficial for chemical and microstructural improvement of sulfidic CPBs only.

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