عنوان مقاله:
شبیه سازی انتقال فلزات سنگین در آب زیرزمینی آبخوان معدن سنگ آهن گل‌گهر

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خلاصه مقاله:
The Golegohar mine area is located ۵۳ km southwest of Sirjan city, Kerman province, Iran. The mine is one of the largest open-pit mines in the country. Due to exploitation, the pit floor level is below the water table. Current dewatering operation is going on by groundwater pumping in digging wells in or out of the pit to prevent flooding. Until now, discharged water and tailings have been disposed near pit without proper environmental safeguards. These waters are in contact with minerals containing heavy metals and it may dissolve or suspend them. Therefore, a tailings dam, constructed with environmental standards, has been proposed to address this problem. So the groundwater pollution plume is studied using FEFLOW software. The results of the sorption isotherm tests for Ni, Cu, and Co show good agreement with the Liner and Freundlich models. Moreover, the plot of Kd for every single solution concentration indicates that the Kd is increasing with Cu concentration while it is decreasing for other metals. Examining the isotherms indicate that Ni and Co behave similarly, while the Cu behavior is different despite equal initial molar concentrations. This implies that the sorption of Cu is higher than Co and Ni. Flow and mass transport simulation in the groundwater of area show due to the dewatering, a capture zone has been developed near the pit. So groundwater pollution plume moves toward the pit and contamination migration (advection) has been prevented to other area. In addition to results of mass transport simulation in the tailings dam show that due to low material permeability and hydraulic gradient in the aquifer, the retention time of the groundwater pollution plume will be long.

کلمات کلیدی:
ابر آلودگی, آزمایش ایزوترم, سد رسوبگیر, مدل آلودگی آب زیرزمینی, نرم افزار فیفلو