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Hammer premature wear in mineral crushing process

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Abstract: This paper presents the premature wear case of high chromium cast iron hammers used for barite rocks crushing. The failure investigations of worn hammer surfaces and examination of barite rocks have been conducted to identify the failure mechanisms. Damaged surfaces were investigated through optical microscopy, scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS) and Vickers hardness test. Barite rocks are characterized by irregular shapes, angular edges and silicon amount. The hammer surfaces examination shows several features of damage as cracking, grooving, metal cutting, carbide fracture, mechanosynthesis phenomenon and chromium migration. These are responsible for a great material loss leading to short life service. The results showed that the failure mechanism combines both impact wear and abrasive wear, which interact together.

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