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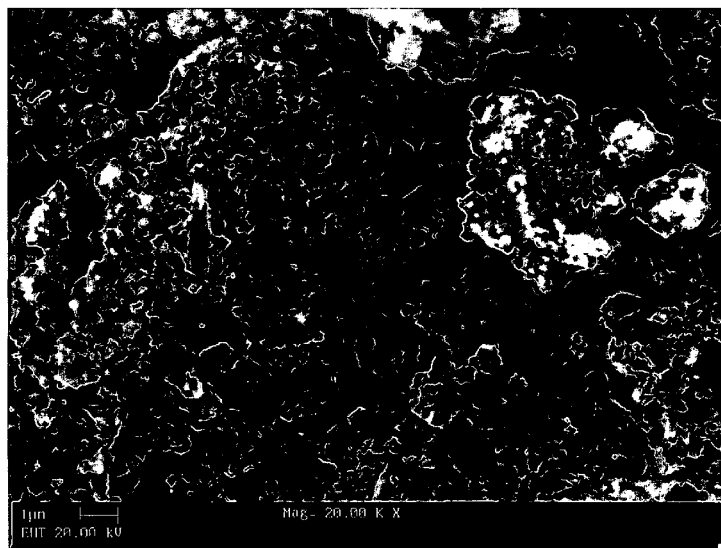
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(54) Title: PROCESSES FOR PRODUCING SYNTHETIC PYRITE

**FIG. 4**

(57) **Abstract:** Process of making high purity, synthetic FeS₂, and an electrochemical battery employing such synthetic FeS₂ in the positive electrode. Synthetic FeS₂ may be prepared by a sulfidation process comprising reacting ferric oxide, hydrogen sulfide, and elemental sulfur at a temperature above the melting point of element sulfur. Synthetic FeS₂ may also be produced by a milling process that comprises (i) milling iron powder and sulfur powder in the presence of a milling media and a processing agent to provide a homogenous powder mixture, and (ii) treating the powder mixture to form FeS₂. In the milling process, the powder mixture may be treated to form FeS₂ by heating the powder mixture or subjecting the powder mixture to a subsequent milling operation.



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