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**BENEFICIATION OF MANGANESE FROM ITS
ORES PRESENT IN ARAB REPUBLIC OF
EGYPT USING SOME REDUCTANTS**

A Thesis Presented

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ABSTRACT

Title:-

“ BENEFICIATION OF MANGANESE FROM ITS ORES PRESENT IN ARAB REPUBLIC OF EGYPT USING SOME REDUCTANTS ”

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Place of Research :

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The present work deals with the application of reduction leaching process to the extraction of manganese from Egyptian fine manganese ore wastes by the aid of metallurgical wastes in the Egyptian Ferroalloys Company. In this technique, metallurgical coke, semi coke, charcoal, pure and impure sugars, starch, molasses, scum and hydrogen peroxide were utilized as reductants in sulphuric acid medium. The optimum conditions of the process are :(120 mesh ore particle size and minus 200 mesh reductant particle size, 6% ore : H_2SO_4 ratio in the case of metallurgical coke, semi coke and charcoal , minus 100 mesh ore particle size and 10% ore : H_2SO_4 ratio in the case of pure, impure sugars, starch, molasses, scum and hydrogen peroxide) 90, 90, 90, 60, 60, 70, 70, 80 and 60 minutes leaching time, 90, 90, 90, 90, 90, 90, 90, 90 and 60 C leaching temperature, 25, 25, 20, 20, 20, 25, 30, 30 and 15% H_2SO_4 , 5:1, 4:1, 3:1, 1:1, 2:1, 2.5:1, 3:1, 4:1 and 1.6:1 reductant : MnO_2 ratios. The percentage recoveries equal 86.5, 93, 98.6, 91.5, 100, 100, 96, 90.5 and 96.2% in the case of metallurgical coke, semi coke, charcoal, pure, impure sugars, starch, molasses, scums and hydrogen peroxide, respectively.

Also , the optimum conditions were applied using electrode paste before and after usage , graphite electrode after usage , dried scum before and after chairring, pure and impure sugar after, chairring., The percentage of manganese recoveries are : 21.11 , 12.15 , 26.2 , 75, 90.5 , 96.92 and 93.78% respectively. Also, the effect of differrent ores origin of, Elba ,(A),(B),(C), Sinai (A),(B) and FeMn slag was studied. The percentage of manganese recoveries equals (77,76.2,75,73.4,70 and 100% Mn) in case of mefallurgical coke,(80,79.11,78,75,72 and 100%) Mn) in case of semi coke, (81.5,80.6,78,86.5,73.6 and 100% Mn) in case of charcoal (100,100,99.3,98.7,96.8 and 100% Mn) in case of pure sugar, (100,97.1,97.9,96,95 and 100%Mn) in case of impure sugar, (98.6, 96,95,95.5,93.5 and 100% Mn) in case of starch, (96,94,93.6,92,90and 100% Mn) in case of Molasses and (90.5, 91, 91, 90, 88.4 and 100% Mn) in case of scum, using Elba (A), (B) and (c) Sinai (A) , (B) and FeMn slag respectively as a diffrent ore origin . Also hydrochloric acid was used with the same reductant and the extraction percent of manganese equals 100% but hydrochloric acid not permitted because of its high price and high consumption. Manganese separated as MnO. MnO equals 98 and 97% on using KOH and Na₂CO₃ as precipitating agents,

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