

# Metal Chlorides Leaching From Electrical ARC Furnace Steel Slag with Hydrochloric

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## ABSTRACT

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Slag as the by-product of steel making has potential for various applications. Slag is produced from many different types of furnaces with different operation conditions. Slags contain alumina, calcium oxide, silica and many more. Physical and chemical properties of slag are affected by different methods of slag solidifications such as air cooled, steam and injection of additives. Therefore, slag is a promising material in applications such as transportation industry, construction, cement manufacture, waste water and waste water treatments. The usage of slag in various applications indicated that slag can be replace natural resources and contributes in the decrease of their utilization.

The project objective is to study the steel making process and identify the element in steel slag. Furthermore, to develop an economical process for converting Electric Arc Furnace slags to Ferric Chlorides [ $\text{FeCl}_3$ ] and Calcium Chlorides [ $\text{CaCl}_2$ ] by using chlorination. Slag is classified as a non-hazardous waste and it can be disposed off to appropriate landfills. Disposal of such material requires a large surfaces and it is rather unfavorable in economical terms. Therefore, researches have been conducted to establish the potential use of slag in different activities.

Throughout the preliminary and feasibility studies, this project will be carried out in four stages that are Preliminary Studies, Optimization on chlorination methods, and Optimization on separation methods and developing process flow sheet.

The result obtained show that when the HCl concentration (M) increases, the mass difference increased. These show that the mass is directly proportional to the HCl concentration. This is because the dissolution rate is affected directly by the HCl concentration.

This expected output of this project is expected to be beneficial to the end users since Ferric Chloride is marketable and widely used in waste water treatment. The production of Ferric Chlorides from abundant steel slag can be done by chlorination and separation methods. Throughout the optimization of these two methods, the most economical and efficient routes are expected to be develop subsequently.