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### Patent Search

Invention Title	PROCESS FOR THE PRODUCTION OF ALKALI METAL SILICATES AND ALUMINOSILICATES FROM CLAY-BONDED AND SODIUM SILICATE-BONDED SPENT FOUNDRY SAND
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#### Abstract:

The present invention provides a simple, facile and clean process route for the production of industrially and commercially important valuable alkali metal silicates from spent foundry sand by amenable synthetic depolymerization mechanism through hydrothermal method. The synthetic process route involves the dissolution of silica mass of waste foundry sand using alkaline solution over a period of 3 hours and at 250°C. Further, the obtained sodium silicate and potassium silicate were converted into corresponding aluminosilicates using aluminium foil and aluminium metal scrap at ambient temperature over a period of 30 and 180 minutes respectively. The production of alkali metal silicates and aluminosilicates were characterized using different modern analytical techniques. The synthetic process route developed in the present work for the preparation of alkali metal silicates and aluminosilicates possesses number of special features with regard to concentration of alkalis used, reaction time, temperature, workup methodology and percentage yield. The value added alkali metal silicates obtained in the present work from spent foundry sand can be used as a source material for the manufacture of different industrial products viz., binding materials, additives, fillers, raw materials, admixtures, molecular sieves, catalysts, masonry products and geopolymer concrete, etc. This invention is considered to be the novel method of waste utilization and effective approach for industrial solid waste management.

#### Complete Specification

##### DESCRIPTION Field of invention

The present invention is related to the development of a novel synthetic process route for the production of alkali metal (sodium and potassium) silicates and aluminosilicates of both sodium and potassium using waste foundry sands obtained from the process of making cores and moulds. The present invention is considered as cutting edge research in the field of conversion of waste material into a value added product and a novel method for solid waste management. The alkali metal silicates produced in the present process can be used for wide range of industrial applications including preparation of silica gel, nanosized silica, zeolite and geopolymer concrete Products.

##### Background of the invention

The development of a novel synthetic process route for the preparation of a value added alkali metal silicates from spent foundry sand through hydrothermal method is involved in the present invention. The present research is mainly focused towards the conversion of waste foundry sand into value added products of industrially and commercially important alkali metal silicates at relatively moderate temperature with minimum possible period of time through environmental friendly approach.

There are several million tones of both soluble and insoluble metallic silicates are manufactured for different industrial, engineering and household applications. The soluble alkali metal silicates are used for making detergents, pigments, catalysts, silica gel, adhesives, cement and building materials. They are also used in paper and pulp, brewing, dairying, food processing and metal process industries. Similarly, aluminosilicates are widely used as catalysts, molecular sieves, detergents and water softener.

##### Objective of the invention

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