

characterization of a low toxicity covering powder used in continuous casting

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Abstract : Continuous casting of steel is a process in which liquid steel is continuously solidified into a strand of metal. The components of the continuous casting steel system are the ladle, tundish and ingots. Covering powders are spread on the surface of the bath of the molten metal of the ladle and tundish, in order to avoid reoxydation, reduce heat loss near the surface, assimilate any non-metallic material and lubrication for isolation of the ingot from the mould. These powders are silica based materials in order to control fusion rate and viscosity. The aim of this work is to study the behavior of a covering powder made of algerian variety of raw materials (such as diatomite). The diatomite is rich of amorphous silica which is considered to be low toxicity, crystalline silica and specially quartz is highly toxic and is related to silicosis. The morphological, thermal and structural studies were followed by electron scanning microscopy (MEB), differential scanning calorimetry (DSC/ATG) and X-ray diffraction (XRD) using the MAUD program based on the Rietveld method combined with a Fourier analysis in order to describe quantitative analysis of amorphous phases.

Keywords : continuous casting, covering powder, XRD, diatomite