

## عنوان مقاله:

Recovery of the submerged arc welding slag

## محل انتشار:

نهمین کنفرانس و نمایشگاه بین المللی مهندسی مواد و متالورژی ایران و چهاردهمین همایش ملی مشترک انجمن مهندسی متالورژی و مواد ایران و انجمن ریخته گری ایران (سال: 1399)

تعداد صفحات اصل مقاله: 13

## نویسندگان:

M Mohsenabadi - *Master of material engineering, Department of Materials Engineering, Science and Research Branch, Islamic Azad University, Tehran, Iran*

K Arzani - *professor of materials engineering, Department of Materials Engineering, Science and Research Branch, Islamic Azad University, Tehran, Iran*

H Najafi - *professor of materials engineering, Department of Materials Engineering, Science and Research Branch, Islamic Azad University, Tehran, Iran*

## خلاصه مقاله:

The slag waste from submerged arc welding (SAW) is an example of solid waste produced during welding that contaminates the environment. This slag contains metal and metal oxides such as Nb, Cr, Mo, Fe, TiO<sub>2</sub>, MnO, MgO, Fe<sub>2</sub>O<sub>3</sub>, Na<sub>2</sub>O, K<sub>2</sub>O, Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, and other additives such as CaF<sub>2</sub>. This research aimed to determine the phases, shape and distribution of the chemical compounds present in the welding slag and also to determine the appropriate process to recycle it in order to be reused for SAW of low-carbon steels. The recycled powder was introduced according to standards and was under qualitative control in the powder welding of steel 'ST 37' with wire welding S2CrM01. During the above control, the created slag was easily separated from the weld metal. Visual studies (VT, MT, and PT) confirm the quality of weld metal. Metalography and microstructure studies of weld metal showed normal structure for weld metal. The Charpy v-notch test indicated a weld metal toughness of approximately 15.61J. Scanning electron microscopy of the solid inclusions in the weld metal showed a relatively similar size to those in the weld metal deposited from original flux. EDS analysis of the solid inclusions in weld metal showed relatively similar composition with those solid inclusions in the weld metal deposited from original flux. Visual, microstructural, and mechanical studies revealed the capability of utilizing recycled powders in SAW of 'ST 37' steels.

## کلمات کلیدی:

'slag waste, contamination the environment, chemical compounds, recycled powder, 'ST 37

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1133436>



