placed in laboratory at a room temperature. Consequently samples were ready for testing by EIS. The Nyquist plots obtained for the concrete sample in the absence and presence of Urmia's pozzolan in 5% concentration.The Nyquist plots were analyzed using Zview software to obtain the impedance parameters. In the presence of Urmia's pozzolan, concrete material clearly showed a decrease in permeability which in turn lead to increase resistivity. Cement resistivity has been increased after the addition of Urmia's pozzolan.

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Study of nano SiO_2 suspension influence on the resistivity of SCC concrete by electrochemical impedance spectroscopy

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World wide more concrete is used than any other man made material with approximately 12 billions tones being manufactured annually. SCC is a concrete; made with appropriate materials, properly mixed, transported, placed, consolidated. The microstructure of concrete mainly controls the physical/chemical phenomena associated with water movements and the transport of ions in concrete.This work therefore presents a summary of the experimental procedure and the results obtained during nano SiO_2 suspension addition on the SCC concrete sample's electrical resistivity using electrochemical impedance spectroscopy (EIS). A total of two concrete samples with W/C ratio of 0.4 (first sample; without nano SiO_2, second sample; with nano SiO_2) were prepared. The samples were demolded 24h after preparation; and Curing was done in lime water for 7 days. Consequently they were removed from the water bath and placed in laboratory at a room temperature.They were tested by EIS. The Nyquist plots obtained for the concrete samples in the absence and presence of 0.5% nano SiO_2 suspension. The Nyquist plots were analyzed using Zview software to obtain the impedance parameters. The resistivity of sample with 0.5% nano SiO_2 is lower than that of sample without nano SiO_2. This result is unexpected in this work, but it can be explained by the curing time, when the curing time of samples is to be low (such as 7 days), the nano SiO_2 can not complete the pozzolanic reaction. Nano SiO_2 suspension addition showed a decrease in the value of electrical resistivity of SCC.

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Fabrication of Nanocrystalline $MoSi_2$ Powder Using Combustion Synthesis and Investigation of its Properties

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Molybdenum disilicade ($MoSi_2$) is a well known material and has a vast application in industry. The reason of being under attention can be attributed to its special properties at elevated temperature such as hardness, chemical stability, good strength, electrical conductivity and excellent wear resistance [1-4]. There are many methods for production of Molybdenum disilicade and in the current research $MoSi_2$ was fabricated using self- propagation combustion method. For this purpose two series of materials including MoO_3,SiO_2 , Al and C powders and MoO_3, SiO_2 ,Mg and Si powders were mixed mechanically and milled for 85 minute . The milled powders were pressed to achieve discs with typical dimension of 7 mm in diameter and 12 mm in height. Combustion synthesis was ignited using an electric arc. The synthesized samples were characterized using XRD, SEM, DSC, TEM techniques. The size of particles obtained in this method is greater than the others, due to the high temperature in the synthesis.

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Preparation and characterization of α-Fe_2O_3 nanoparticles and adsorption isotherms investigation of Cd(II) on hematite

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α-Fe_2O_3 is a very important multifunctional material which is used in fine ceramics, catalysts, pigments and is one of the best adsorbent for removal of heavy metalsfrom aqueous solution [1]. In this study α-Fe_2O_3 nanoparticles were prepared by sol-gel combustion techinque [2]. The aim of this study to investigate the ability of α-Fe_2O_3 to adsorbed heavy metales like Cd.Iron nitrate have been used as precursors and citric acid as an oxidising agent to prepare hematite. The α-Fe_2O_3 powders were characterized by Scanning Electron Microscopy (SEM), X-ray diffraction (XRD), and Fourier Transform Infrared (FTIR) spectroscopy and adsorption processing evaluate through Batch method.From the obtained XRD patterns, the particle size of α-Fe_2O_3 has beendetermined. The obtained XRD pattern of the hematite is shown in fig.1.consequently, one can obtain the average particle size, from the broadening effect of the most intense peak employing the scherrer formula. The particle size of hematite are found to be 41/58 nm. Also as a result the particle size decrease with increase in milling time.