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Eminent Characterizations of Different Clay Species based upon the Advanced Chemical and Process Applications

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Abstract

Clay is a group of soil which is having a series of specific characteristics among other soil types including chemical characteristics, physical characteristics and mechanical characteristics. According to the most of modern researches, there were investigated some of advanced chemical characteristics of various clay types and experimentations of their applicability in different simple and advanced chemical processes. Sri Lanka is a country which is rich in different clay types since most of clays are being used in some primary tasks such as the manufacturing of bricks and roof tiles. The dominant aims and objectives of the existing research were the advanced chemical and microscopic characterizations of three different selected clay varieties and disclosing of their eminent applications in advanced chemical tasks. The representative clay samples were collected from Matale, Maduragoda and Dankotuwa areas in Sri Lanka and three different clay types were named as in order of anthill clay, brick clay and roof tile clay while also considering their current uses and origin. The selected clay samples were characterized using X-ray florescence (XRF) spectrometer, X-ray diffraction (XRD) spectrometer, Fourier transforms infrared (FT-IR) spectrometer, optical microscope and Scanning Electron Microscope (SEM). The obtained results showed the presence of at least 75% of Fe as the abundant metallic element in each clay type with Ti, K, Zr, Ba and Ca as trace metals, presence of kaolinite and muscovite as major clay minerals with a few of Fe minerals in trace amounts and quartz as the major non-clayey mineral while containing some impurities in each of clay type. Therefore, these clays can be developed as adsorbing materials, catalytic materials and refractory materials in advanced industrial chemical processes. In the case of catalytic applications, it is possible to develop and enhance such clay types with chemical treated forms, composite materials and nanomaterials to obtain high performances.

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Biography

Mr. Suresh Aluvihara is a postgraduate research scholar at the Department of Chemical and Process Engineering, University of Peradeniya, Sri Lanka. He has received his B.Sc. (Hon's) degree in the year 2017 that relevant with Mineral Science and Earth Resources. According to his research experiences, he has achieved a large number of research publications in the modes of abstracts, conference papers and journal articles that associated with his first degree's research and postgraduate research. As the special achievements he has participated as a keynote speaker and invited speaker for a few of Material Engineering, Chemical and Environmental Engineering conferences. According to his international research activities he was appointed as a voluntary editorial board member for some special issues and a potential reviewer for a few of much reputed journals and he was invited as an organizing committee member for global research conferences meanwhile receiving some honor memberships in worldwide scientific research associations. Also he has been awarded as a best young scientist and best research scholar in a few of awarding schemes around the world.