## Annual Congress on ENVIRONMENTAL POLLUTION AND SUSTAINABLE ENERGY July 20-22, 2017 Melbourne, Australia

## The treatment of dye wastewater using natural South African magnesite

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Discharging industrial colored wastewaters into aqueous environments can cause adverse effects on aquatic life due to the toxic nature of synthetic dyes. The present study aimed to evaluate the efficiency of using natural South African magnesite to remove an anionic dye from aqueous systems. The natural nanosorbent was characterized by Transmission Electron Microscopy, Fourier Transform Infra-Red and X-ray Diffraction analysis. Various important parameters namely contact time, initial concentration of dyes, magnesite dosage, solution temperature and solution pH were optimized to achieve maximum adsorption capacity. The XRD results revealed that raw magnesite contains magnesite, periclase, dolomite and quartz as the crystalline phases. Optimum conditions were observed to be 60 min of agitation, 0.1 g dosage of magnesite per 50 mL of aqueous solution, 40 mg/L initial dye concentration and room temperature. Removal of DR81 from aqueous solution was observed to be independent of initial pH of the aqueous solution. The adsorption ratio toward 40 mg/L of DR81 was 96.27%. The results indicate that natural South African magnesite is an efficient material for the removal of DR81. The magnesite, due to high accessibility, low cost and non-toxicity can be considered a good replacement option of other high cost materials used to treat colored wastewater especially in developing countries like South Africa.

## **Biography**

Tholiso Ngulube is currently pursuing her PhD in Environmental Sciences at the University of Venda in South Africa. She is a Member of the Young Water Professionals in Southern Africa. She has also published articles in international peer reviewed journals and has attended various international conferences. She has been serving as a core Lecturer at Applied Centre for Climate and Earth Science Systems (ACCESS) and is also a Tutor and Mentor at the University of Venda.

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