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# Chemical toxicity of biodiesel – A study by ICP-MS

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## Abstract

This is a study with high performance ICP-MS to determine toxic elements in neem biodiesel and commercial biofuels. Trace metals in biofuels can create unwanted problems in the environment, machinery and to general health and therefore, there is a need for detailed assessment of such species. The neem biodiesel that we investigated was produced in our laboratory from neem feedstock (kernels and fruit). A two-step acid-base catalysed esterification process was applied to produce the neem biodiesel. Small quantities of the sample were digested in mild acid media and submitted to high resolution ICP-MS analysis. The basic physical properties of neem biodiesel were in agreement with those of regular petrodiesel (2D). Over twelve toxic elements were detected in the neem biofuel and their levels were compared with those of commercially obtained biofuels (B100C/B100R) treated and analyzed under identical conditions. In general the neem biodiesel displayed a lower level of toxicity. The study is of definite interest to environmentalists and ongoing sustainable development.

## Biography

Pillay is a Fellow of the Royal Society of Chemistry. He is skilled in a wide range of instrumental techniques including Neutron Activation, XRF, Gamma ray Spectroscopy, ICP-MS, Atomic Absorption and UV-Vis Spectrophotometry. He is experienced in the area of analytical and environmental chemistry, and has supervised PhD and MSc students. He has lectured widely in these areas and in general chemistry, and is keen on promoting cross-disciplinary teaching and research. He has more than 120 peer-reviewed journal articles, and several conference presentations. He was Guest Editor and member of the Editorial Board of the *International Journal of Environmental Studies* between 2005 and 2009. He is presently member of the Editorial Board of the Open Hydrology Journal.