NRF Research Chair in Biofuels
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Title:	Microwave-assisted biobutanol production from biomass using nano based metal oxides as catalysts
Abstract:	Biofuel technologies have drawn remarkable industrial interest. This is ascribed to beneficial properties compared to negative climatic conditions caused by the use of petroleum fuels. In particular, biobutanol is considered to be drop-in fuel over bioethanol. This arises from its properties that are considered to be more advantageous than that of bioethanol. Biobutanol properties are akin to the current petrol and this makes it more acceptable. Therefore, new and developed technologies for the production of biobutanol are required. The current study is designed to address three fold themes or objectives. An extensive literature survey was based on two topics; the traditional biobutanol production (ABE fermentation) and catalytic upgrading of bioethanol to n-butanol. A baseline ABE fermentation was conducted to produce biobutanol and organic acids from sweet sorghum juice using *Clostridium acetobutylicum* and *Clostridium tetanomorphum*. The last objective was to upgrade bioethanol to n-butanol using metal oxide catalyst on a fixed microwave reactor with inert gas pipelines. Overall, biobutanol production can go a long way in making a sustainable technology for South Africa.
Lead institution:	North-West University, School of Chemical and Minerals Engineering, Biofuel research group.
Partner institutions:	-
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Supervisor name:	Professor Sanette Marx
Degree:	PhD
Funded by:	National Research Foundation (NRF)
Start date:	February 2013
End date:	November 2016
Feedstock:	Sweet sorghum and bioethanol
Value chain products:	Biobutanol, bioethanol, acetone, acetic, butyric, succinic lactic acids, acetaldehyde, and butyraldehyde.
Geographic source of the feedstock:	Sweet sorghum juice was obtained from Agricultural Research Council (ARC), Potchefstroom, North West province, South Africa. Bioethanol was obtained from Rochelle Chemicals (RC), South Africa.