

Masters position in Chemical Engineering (Waste Valorisation)

Production and upgrading of tyre derived oil for production of fuel for fuel blending

Project description

In the last few years a significant amount of research has been conducted in the Department of Process Engineering on the use of spent tyres. One of the most promising methods to valorise spent tyres are to pyrolyse the tyres and to valorize the resultant crude oil, commonly known as Tyre Derived Oil (TDO). However, the TDO has a wide boiling point range and contains a significant amount of sulphur. To date research has been conducted on decreasing the sulphur content and on fractionating the TDO. These studies have, however, to date not been integrated yet integration of the previous studies may results in a superior product.

The proposed masters project will consider the production and fractionation of TDO with the aim to produce fuel fractions that are low in sulphur and can be blended into various fuel fractions. The study will consider both the production of TDO through pyrolysis, the partial condensation of the product streams and the separation of the various streams through techniques such as distillation. The study will consider the interaction between these aspects and investigate how to produce the optimum fuel fraction. The project will entail a significant amount of laboratory work, in particular pilot plant scale production and separation techniques. However, as the project is a continuation of previous studies, it is envisioned that previously constructed set-ups will be used and very little equipment development will be required.

Eligibility Criteria

The proposed candidate should hold a Bachelor's degree in Chemical Engineering (or equivalent) and have excellent spoken and written communications skills. Laboratory experience is preferred but not required, however the candidate should be prepared to spend a significant amount of time during the project conducting bench and pilot plant scale experiments.

Application Requirements

Interested applicants should submit a cover letter including motivation for the position, curriculum vitae (CV), copies of their academic transcripts, copies of degree certificates, copy of South African identity document/passport if not South Africa, and contact details of two academic references to Prof. Cara Schwarz (cschwarz@sun.ac.za) Department of Process Engineering, Stellenbosch University, South Africa. Shortlisted applicants will be asked to interview online/via telephone.

Evaluation of possible candidates will start immediately but will continue until the position is filled. Preference will be given to candidates that can start by 28 February 2021.