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Reviewing the value of synchrotrons for Sasol; relevance of research at synchrotrons for African Industries

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Sasol is an international integrated energy and chemical company that develops and commercializes chemical technologies. The company is listed on the Johannesburg and New York stock exchanges. Sasol's experience and understanding of Fischer Tropsch synthesis provides us with a unique reliable energy value proposition nationally and internationally. Sasol's global presence includes a number of African countries, for example Botswana, Zambia, Nigeria and Egypt. Sasol's financial results showcases our focus on sustainable value creation and our South African energy cluster listed an operating profit of R41.7 billion for the 2014 financial year. One of the keys to Sasol's success is corporate social investment that maximizes social development and value for our stakeholders in the communities where we operate. The Sasol Global Foundation was established in 2013 to coordinate and optimize these investments.

Our in-house technology development capacity includes more than 300 employees with PhD's and an intellectual property portfolio of more than 500 registered patent families. Our analytical technologies include advanced analysis of hydrocarbon synthesis streams and atomic scale resolution characterization of catalysts. Our research facility makes use of synchrotron and neutron techniques and we have the in-house capability to design experiments and interpret high resolution data. In-house training of scientists on synchrotron data manipulation and interpretation is an on-going activity. We encourage our post-graduate bursary holders to apply for academic beam time and often assist with proposal writing. The XRD and synchrotron group participates in the South African synchrotron strategy, roadmap, conferences, workshops, beam times (academic and commercial) and publishing. We provide a world-class catalyst characterization and fundamental understanding [1] in support of our Coal-To-Liquids (CTL), Gas-To-Liquids (GTL) and new catalyst development partners. A few published examples including synchrotron and neutron results will be presented: ɣ-alumina [2-4] and in situ synchrotron powder X-ray diffraction of the reduction of a model catalyst [5].

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[1] van de Loosdrecht, J.; et al, Fischer–Tropsch Synthesis: Catalysts and Chemistry. In: J. Reedijk and K. Poeppelmeier, ed. Comprehensive Inorganic Chemistry II, Vol 7, Oxford: Elsevier; 2013, 525-557.
[2] Wefers K.; Misra, C.; Oxides and hydroxides of aluminium, ALCOA Laboratories, Pennsylvania, USA, 1987, 20.
[3] Kim, H.; Kosuda, K.M.; Van Duyne, R.P.; Stair, P.C. Chem. Soc. Rev., 2010, 39, 4820-4844.
[4] Smrčok, Ľ.; Langer, V.; Křesťan, J. Acta Cryst., 2006, C62, i83-i84.
[5] du Plessis, H.E.; Forbes, R.P.; Barnard, W.; Erasmus, W.J.; Steuwer, A. Physical Chemistry Chemical Physics, 2013, 11640-11645.

Summary

Synchrotron techniques have proven their value in our analytical portfolio. African industries and academia will benefit from synchrotron based research that is aligned to the corporate strategy and supported by targeted social investment.

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