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# Effects of the chemical composition of coal tar pitch on the baking zone temperature in Soderberg electrode systems

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Coal can be converted to different chemical products through processes such destructive distillation. The destructive distillation of coal yields coke as the main product with by-products such as coal tar pitch (CTP). CTP has a wide range of applications especially in the carbon processing industries with typical applications including manufacture of anodes used in many electrochemical processes as well as Soderberg electrodes used in electric arc furnaces. This paper presents results from a study carried out to establish the baking isotherm temperature of coal tar pitch during thermal treatment. Thermomechanical analysis (TMA) was used to measure the dimensional changes which take place in pitch in the baking zone during thermal treatment. Elemental analysis, Fourier Transform Infra-Red (FT-IR) and Nuclear Magnetic Resonance Spectroscopy were used to evaluate the chemical composition of different raw and thermally treated coal tar pitch samples. The results from this study demonstrated that the baking isotherm temperature of coal tar pitch is the same irrespective of the chemical composition and origin of the coal tar pitch. In addition to that, the results also indicated that the coal tar pitches shrunk approximately 12% if exposed to temperatures above the baking isotherm temperature up to 1300°C.

## Biography

L Shoko has completed his PhD in Chemistry from North West University (South Africa) in 2014. He is currently working as a Senior Research Technologist in the Department of Chemical Engineering at the Vaal University of Technology. His thesis was focused on the study of effects of chemical composition of coal tar pitch on dimensional changes during graphitization. He is currently working on a project that involves producing activated carbon from coal tar pitch and its application in removal of phenols from waste water.

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