

## ANTIOXIDANT ACTIVITY AND MECHANISM OF ACTION OF SOME CARDANOL BASED MANNICH BASES AND DITHIOCARBAMATES

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Antioxidants are incorporated into rubber, plastics, lubricating oils and a variety of other substances to prolong their storage life and service life. The common rubber antioxidants are hindered phenols and amines which are all imported for use in the local rubber products manufacturing industry. This study is concerned with the synthesis of aminophenols and their corresponding dithiocarbamates from cardanol which is obtained from locally available cashewnut shell liquid.

Several new types of antioxidants have been synthesized using cardanol and metacresol as phenols and dimethyl amine and morpholine as amines by Mannich reaction using formaldehyde as the condensing agent. The dithiocarbamate derivatives of the Mannich bases were prepared by treating these compounds with carbon disulphide. The efficiency of these compounds in natural rubber and in model hydrocarbon substrates have been studied using oxygen absorption technique, volatility measurements, accelerated ageing tests and stress relaxation measurements. The mechanism of antioxidant action of the synthesized compounds has been studied by analysing the oxidation products of cumene and antioxidant induced decomposition products of cumene hydroperoxide, using gas liquid chromatography. The results show that the synthesized compounds are comparable in activity to some of the most popular commercial antioxidants, and their mode of action is predominantly by a chain breaking mechanism.