

KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

INDIAN INSTITUTE OF SCIENCE, BANGALORE -560012



A PROJECT REPORT ENTITLED
“JATROPHA OIL CAKE FILLED STYRENE BUTADIENE
RUBBER COMPOSITES”

*Submitted in partial fulfillment of the requirement as specified by
Visvesvaraya Technological University for the award of Bachelor of Engineering degree
in Polymer Science and Technology*

Submitted by

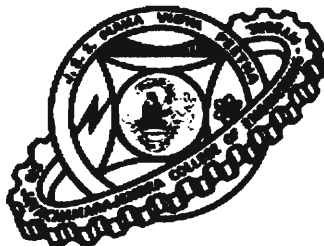
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ABSTRACT

Fabrication of newer materials using agro based waste materials as fillers is a challenging area for the material technologists. Using of JOC by-product in the generation of polymer composites is one of the routes to making use of the waste for better purpose instead of polluting the air by burning

A series of green rubber composites have been fabricated by varying the amounts viz., 0, 5, 10, 15 and 20 by wt. % of natural filler (jatropha oil cake (JOC)) of in styrene butadiene rubber (SBR). The effect of incorporation of JOC content on the optimum cure time (rheological properties) of styrene-butadiene rubber (SBR) was investigated using rheometer. The bound rubber content of uncured rubber samples has been determined from equilibrium swelling measurement. The determination of the crosslink density of the vulcanized rubber compounds was carried out with a swelling method. The effect of JOC content on the physico-mechanical properties such as surface hardness, tensile strength, elongation at break and tensile modulus have been measured. The incorporation of JOC into SBR found to reduce the tensile strength and surface hardness. The abrasion resistance and percentage elongation of SBR composites was found to increase with increase in amount of JOC content. The effect of heat ageing at 70⁰C for 48 and 168 h on weight and tensile strength loss has been investigated. The JOC incorporated SBR composites have been evaluated for chemical resistance. The thermal characteristics of the composites have been evaluated using differential scanning calorimetric (DSC) and thermogravimetric analyser (TGA). Morphological behaviours of the cryofractured specimens were performed using scanning electron microscopy (SEM).