

# Hyejin Lee

Prof. Mekonnen

## Effects of crosslinking in SEBS/EPDM/DCP foam and an enhanced oil absorption capacity

Environmental issues concerning oil spills and oil contamination in water have brought about strong demand for a highly efficient oil-absorbing material to separate oil contaminants from water. In this research, a novel rubber foam of styrene-ethylene-butylene-styrene (SEBS) incorporated with ethylene propylene diene monomer (EPDM) through the crosslinking of dicumyl peroxide (DCP) was fabricated using batch mixing and compression molding. The cross-linking effect of DCP allowed SEBS/EPDM/DCP foam to expand extensively with a 1200 vol.% volume change (expansion ratio 12.8-13.1) and created large and highly structured pores. As a result, the material exhibited outstanding oil absorption ability up to 1030 wt.% of oil containment in the polymer body due to favored capillary action. More importantly, the crosslinked polymer chains aided the rubber foam to be resistant to dissolution and maintain its structure stable in the oil. Also, the inherent hydrophobicity of SEBS and EPDM led to the high oil/water separation ability of SEBS/EPDM/DCP foam, indicating that this novel rubber foam can be an excellent oil separating material for the remediation of oil-contaminated water.