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THE EFFECT OF NANO-SIZED ZINC OXIDE ON THE CURE BEHAVIOR AND PROPERTIES OF ETHYLENE PROPYLENE DIENE RUBBER

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EPDM compounds containing various nZnO contents were prepared and their cure behavior, hardness and tensile properties were compared with the sample activated by conventionally used ZnO (CUZ). The isothermal cure characterizations revealed that the sample containing 3 phr of nZnO almost showed the same value of t_{90} and maximum torque as the sample with 5 phr CUZ. The hardness results interestingly depicted that the incorporation of 3 phr nZnO into the EPDM system could lead to the improvement of about 6% for 3 phr nZnO containing species over the sample containing 5 phr CUZ. In addition, although the tensile strength of nZnO containing samples was found slightly lower but the elastic modulus appeared to significantly increase by the inclusion of nZnO instead of CUZ. Consequently, these results clearly indicate two important roles of nZnO on the EPDM systems: one as an effective activator and the other as nanofiller which could improve the final performance of such elastomers.