Manufacture of EPDM / $Na_{0.33}WO_3$ nanocomposites for improved thermal properties

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Recently, the development of nanoparticles capable of absorbing the wavelengths of the near-infrared radiation from the sun and efficiently utilizing them has become important. One of the biggest problems when working underwater is heat loss. Therefore, active in the water, the warming function of diving suit is important. To improve the warmth of diving suit, we synthesized tungsten bronze nanoparticles($Na_{0.33}WO_3$) which absorb sunlight and emit thermal energy. These days, synthetic rubber neoprene is mainly used for diving suit. But chloro groups in neoprene can cause environmental pollution. So, we have tried to replace neoprene with EPDM which is eco-friendly and similar in properties to neoprene. To improve the performance of EPDM(Ethylene propylene diene monomer), we intend to use tungsten bronze nanoparticles that mix well with EPDM. Then the thermal properties were confirmed by mixing according to weight ratio with EPDM.