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Abstract: The photostabilization of poly(vinyl chloride) (PVC) films by 2-thioacetic acid-5-phenyl-1,3,4-oxadiazole with Sn(II), Ba(II), Ni(II), Zn(II), Cu(II), and Ca(II) complexes was investigated. PVC films containing different concentrations of complexes ranging from 0.1% to 0.5% by weight were produced by the same casting method from THF solvent. The photostabilization activities of these compounds were determined by monitoring the carbonyl and polyene indices with irradiation time. The changes in viscosity average molecular weight of PVC with irradiation time were also tracked (using THF as a solvent). The quantum yield of the chain scission (Φ_{cs}) of these complexes in PVC films was evaluated and found to range between 4.94×10^{-8} and 1.61×10^{-7} . The results obtained showed that the rate of photostabilization of PVC in the presence of the additive follows the trend: $\text{Sn}(\text{OX})_2 > \text{Ba}(\text{OX})_2 > \text{Zn}(\text{OX})_2 > \text{Ni}(\text{OX})_2 > \text{Cu}(\text{OX})_2 > \text{Ca}(\text{OX})_2 > \text{OX}$ Based on the experimental results obtained, several mechanisms were suggested depending on the structure of the additive. HCl scavenging, UV absorption, peroxide decomposer and radical scavenger for photo-stabilizer additives mechanisms were suggested.

Key Words: Photostabilizer, PVC, oxadiazole.

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