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THE EFFECT OF ACCELERATED AGING ON THE PROPERTIES OF A- C:H THIN FILMS OBTAINED BY THE PECVD PROCESS FROM RECYCLED PET FROM PACKAGING

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Poly (ethylene terephthalate), PET, is one of the most polymers used for bottle fabrication in the soft drink market, and, consequently, one of the most abundant waste in the Municipal Solid Waste (MSW). Due to these, researches directed towards recycling become an important action to decrease the large packaging waste quantity generated by PET and other polymers. One of the alternatives to using packaging made from recycled polymer is the functional barriers that reduce the possibility of contaminants migrations from post-consumer material to foodstuff. Amorphous hydrogenated carbon films could be used as a functional barrier in food packaging. Besides film effectiveness in preventing contamination, a crucial property to be considered is adhesion between polymer and the functional barrier, a reduction of which could damage the packaging and its shelf life. In spite of same studies on adhesion between thin film and polymer samples, few of them have evaluated the effect of time, temperature, and contact with food stimulants. Then, it is necessary to expose the functional barrier at conditions that differ from the regular use, to simulate an accelerated aging. Accelerated aging test exposes samples to higher temperatures for shorter periods than the conventional one. This study aims at evaluating the influence of time, temperature and contact with food simulants in thin films of hydrogenated amorphous carbon (a-C:H) deposited by Plasma Enhanced Chemical Vapour Deposition (PECVD) in post-consumer recycled PET bottles. The shelf life of the samples was analyzed by the influence of time, temperature and contact with alimentary simulants, like acetic acid (3%) and ethanol (15%), according to FDA guidelines. The modifications were evaluated by the tape test method, optical microscopy and contact angle