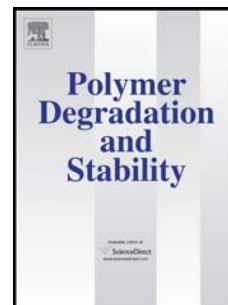


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## Accelerated ageing of polylactide in aqueous environments: Comparative study between distilled water and seawater

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### Abstract

Pollution of nature by plastics is a major environmental problem and the challenge for the future is to manage the lifetime of polymers better. The aim of this study is to establish a baseline on degradation mechanism and degradation kinetics for lifetime prediction of polylactide (PLA) in a marine environment. The ageing of PLA was accelerated by raising temperature in distilled water, filtered and renewed seawater and natural seawater. Samples were immersed in distilled water for six months at different temperatures (25, 30, 40 and 50°C) in order to evaluate the influence of temperature on PLA degradation kinetics and to predict lifetime. Then, samples were immersed in seawater both in the laboratory and at sea, in order to compare the effects of environment, marine organisms and salt, on degradation. The different degradation steps were followed by gravimetry, tensile tests, scanning electron microscopy (SEM), steric exclusion chromatography (SEC) and differential scanning calorimetry (DSC). In distilled water, accelerated ageing of PLA is complex with deviation

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