

IRAP102

PVA hydrogel as matrix for dermatological active agents immobilization

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Cosmetic industries due to their great market size is promoting technological run to innovate and improve their products by adding new active agents or introducing hydrogel for controlled release dressings to the market. Studies of poly vinyl alcohol (PVA) hydrogels produced by radiation-induced crosslinking have been done to verify the possibility of active ingredients incorporation. The ionizing radiation presents the advantage to occur polymerization and sterilization simultaneously in the same process.

The aim of this work was the study of PVA hydrogel physical-chemical characterization and the stability of Arct'Alg® after irradiation to immobilize it for dermatological uses. Arct'Alg® is an extract derived from red algae biomass which has antioxidant, anti-inflammatory and tissue regeneration stimulant properties.

The physical-chemical characterization of the hydrogel membranes was carried out by gel fraction, swelling and mechanical properties tests and the preliminary biocompatibility test by *in vitro* assay of cytotoxicity. The stability of Arct'Alg® after irradiation was verified by HPLC. Samples were injected into a reverse-phase C18 column, the flow-rate was 1mL/min and the detection was performed at 200nm.

The physical-chemical characterization of PVA hydrogel showed appropriate results. The gel fraction result was about 85% and the swelling test showed that the hydrogel increased at about 12 times its initial weight. The PVA hydrogel evaluated in the cytotoxicity test indicated no evidence of toxicity.