

Optimization of materials of radiosensitive liquid core microcapsules

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Abstract

The materials for the liquid core microcapsule, which can be decomposed by radiation, was innovated by optimizing the composition of alginate and hyaluronic acid, using Particle Induced X-ray Emission (PIXE).

The 0.2g of alginate was mixed into the 0.05g, 0.5g, or 1.0g of hyaluronic acid, supplemented with 0.MOL Carboplatin. Those mixture was dissolved to the distilled water and sprayed into the solution of CaCl₂ (3.486g/100ml), and polymerized. The capsules were washed by normal saline, using centrifuge of 1000 rpm/5min for three times. The one million of capsules was floated in the 1ml of normal saline, then the single dose of 5 or 10 Gy of ⁶⁰Co gamma ray was irradiated. The emitted carboplatin was measured by detecting Pt signals of carboplatin.

The diameter of generated microcapsules was 23±2.3µm. The emission of liquid core by radiation was mainly influenced by the composition of hyaluronic acid and alginate. The maximum emission was observed when the rate of alginate and hyaluroic acid was 2:1.

The best composition between alginate and hyaluronic acid was available for the microcapsules' emission of its liquid core. Our experiment goes next step for putting the microcapsules to practical use, using the BALB/c mice.