

Unconverted Double bonds in hydrogel microparticles synthesized by stop flow lithography

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Stop flow lithography(SFL), a versatile technology for synthesizing multi-functional hydrogel microparticles used in diverse fields such as diagnostics and therapeutics, generates hydrogel networks containing unconverted double bonds(UCDBs). In this research, we quantitatively analyze the UCDBs in hydrogel microparticles synthesized via SFL under different conditions such as UV intensity and UV exposure time. Further, we prove that the UCDBs in hydrogel networks lead to not only the changes in chemical properties but also serious effects on cells. To prevent the potential problem mentioned, we present a simple and effective method to eliminate the UCDBs by covalently binding inert polymer chains to UCDBs by means of a click reaction. We validate that the hydrogel particles that are free of UCDBs show chemically inert, much higher biocompatibility compared with those of untreated controls.