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Characterization of hybrid hydrogel with different shape of particles after gamma-ray radiation DONGHYUN KIM, HOIK LEE, HYEMI PARK, DAEWON SOHN, Department of Chemistry, Hanyang University, Seoul 133-791, Korea — Due to high specific surface area and the ability to absorb organic molecules, inorganic particles such as silica particle (spherical), imogolite (rodlike), and clay (fan shape) could be used as precursors for hydrogels. The hydrogel which had 3-D network structure was directly prepared by polymerization with acrylic acid (AA) on hydroxide surface of inorganic particles that was irradiated by gamma-ray at ambient condition. Surface of inorganic particles was used as sites of initiator and cross-linker to make hydrogel, so we don't need any additional additives to make hydrogel. The properties of hydrogel were characterized by small angle x-ray scattering (SAXS), universal testing machine (UTM), and Raman spectroscopy. By changing the inorganic particles/monomer ratio, the mechanical strength was significantly changed. The synthesized hydrogel can be elongated maximum 1800%. 2D SAXS pattern was different depending on the shape of inorganic particles. And the hydrogel swelled only in basic solutions at $\text{pH} > 7$.

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