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Balancing Size Exclusion and Adsorption of Methacrylate Polymers in Nanoporous Silica ASEM ABDULAHAD, Rensselaer Polytechnic Institute, SEKYUNG LEE, Pohang Institute Science and Technology, TAIHYUN CHANG, Pohang Institute of Science and Technology, CHANG RYU, Rensselaer Polytechnic Institute — Liquid chromatography at the critical condition (LCCC) is a high performance liquid chromatography (HPLC) technique that lies between size exclusion chromatography (SEC) and adsorption-based interaction chromatography (IC) where the elution of polymers becomes independent of polymer molecular weight. At LCCC, the balance between the entropic exclusion and the enthalpic adsorption interactions between polymers and stationary phases results in the simultaneous elution of polymers regardless of molecular weight. Using C18-bonded silica chromatographic columns we demonstrate the LCCC elution of a series of methacrylate polymers and discuss how the alkyl side groups in methacrylate polymers affects the adsorption of polymer chains against the size exclusion in nanopores.

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