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Formation of the Monolithic Silica Gel Column with Bimodal Pore Structure

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

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Abstract: A biporous monolithic silica gel column possessing both micrometer sized through-pores and nanometer sized mesopores located in the silica skeletons was prepared and the high concentration porogen (e.g., 2 mol/L ammonium hydroxide solution) was used for increasing mesopore size in this work. The mechanism for the preparation of the monolithic column was investigated in detail. Moreover, the effect of the polyethylene glycol concentration in the starting solution was studied and it was found that a lower concentration range was also suitable for forming the interconnected porous structure for the monolithic silica gel column. At lower concentrations, however, the phase separation mechanisms and experimental results were different.

Key Words: Monolithic silica gel column, Phase separation, Sol-gel transition, Pore structure

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