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**Design and Synthesis of pH Sensitive Polymeric Sensor for Potential Molecular Imaging using Fluorescence Resonance Energy Transfer**  
SUNG WOO HONG, KEON HYEONG KIM, JUNE HUH, CHEOL-HEE AHN, WON HO JO, School of Materials Science and Engineering, Seoul National University — Molecular imaging in tumor biology is becoming one of the most active scientific and clinical research areas. Especially, optical imaging based on fluorescence resonance energy transfer (FRET) phenomena has emerged as an important technique to describe clinical targets in vivo. The goal of this study is the development of polymeric biosensor which emits specific fluorescence upon responding to lowering pH. In this work, sulfadimethoxine is chosen for pH sensitive moiety and is conjugated with methacryloyl chloride to synthesize methylmethacrylate based sulfadimethoxine monomer (MbSDM). Coumarin and pyrene are selected as FRET donor and acceptor. Modified coumarin derivative is used as atom transfer radical polymerization (ATRP) initiator of MbSDM to prepare pH sensitive polymeric backbone with coumarin at one end. The sequential ATRP of methylmethacrylate based pyrene is performed to position pyrene at the other end of polymeric backbone. This polymeric backbone could be reversibly changed in end-to-end distance in response to the variation of pH condition, which results in the pH-switching photonic property.

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