

Colorimetric response of mixed vesicles composed of PCDA and PCDA-EDEA on hazardous chemicals

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Chemosensors based on conjugated diacetylene polymers became attractive because of its colorimetric transition from blue to red color by external stimuli. Among the conjugated diacetylene polymers reported, PCDA and PCDA-EDEA were tested and vesicles were prepared. Both polymers consist of hydrophobic carbon tails, diacetylene unit, and hydrophilic head group. For head group, PCDA has carboxylic group and PCDA-EDEA has amine group. Having a different functional head group resulted different intensity for color transition upon reactions by chemical solutions. By the acid-base reaction, PCDA vesicles react with ammonium hydroxide as PCDA-EDEA vesicles with hydrogen chloride and none reacts as formaldehyde was added. However, when mixed vesicles composed of PCDA and PCDA-EDEA tested with chemical solutions, as the mixing ratio of two monomers during preparation of mixed vesicles varies, they showed unique colorimetric responses. From this phenomenon, it was suggested that varying mixing ratio of diacetylene monomers in preparation of vesicles can be used in chemical sensors for detection of other hazardous chemicals.