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Conjugated thiophene oligomers have attracted numerous investigations which have been concerned as active layer ingredients in electronic devices. The ease in chemical modification of their structures can potentially allow us to fine-tune their optical and electronic properties for their utility in electronic devices.

A series of thiophene-based oligomers containing anthracene moiety in the center of molecules (1a~c, 2a~c) were successfully synthesized using the palladium-catalyzed Stille reactions. (Dimethyloctyl)silyl and n-hexyl group were chosen as lipophilic end-capping groups on the grounds that they might render a very ordered molecular arrangement in the solid state through self-assembling.

The (dimethyloctyl)silyl-substituted oligomeric thiophenes 1b and 2b showed to have lower melting point comparing to the hexyl derivatives 1a and 2a (1a; 185°C, 1b; 79°C, 2a; 210°C, 2b; 118-119°C) although the silyl derivatives 1b and 2b are more soluble in organic solvents than the hexyl derivatives, 1a and 2a. As the number of thiophene moiety increases the solubility of oligomeric thiophene compound become decreased.

The devices to test p-type transistor ability were fabricated utilizing vacuum deposition and spin coating methods with hexyl substituted oligomeric thiophenes 1a and 2a. The device test revealed no ability for p-type transistor which seems to be ascribed by break of conjugation through a nonlinear conformational disposition of anthracene moiety in the oligomeric arene array. 9,10-arene-substituted anthracenes are known to prefer twisted conformations.