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Molecular arrangements and optical properties of organic salts of aromatic sulfonates with primary amines in solid state.

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We report here a convenient approach to control optical properties of organic salts involving anthracene moieties in the solid state. Anthracene-2, 6-disulfonic acid (ADS) and various primary amines were mixed in MeOH to yield the corresponding organic salts. The salts were recrystallized from various organic solvents to give their single-crystals. X-ray crystallographic studies revealed that planar arrangements of anthracene moieties are different from that of anthracene itself and vary from one case to another. For example, anthracene moieties of the salt of ADS with *t*-amylamine (*t*-Am) have two-dimensional arrangements, while those with *n*-amylamine (*n*-Am) have one-dimensional ones.

Next, we measured fluorescence spectra and quantum yields. Fig. 1 shows fluorescence spectra of anthracene itself and salts of ADS with *n*-Am and *t*-Am. Fluorescence spectra of salts are 10-15 nm shorter than that of anthracene itself in wavelength. In addition, fluorescence quantum yields are 50.3 %, 17.7 % and 2.0 % in case of anthracene itself, salt of ADS with *t*-Am and that with *n*-Am, respectively. It was found that there is a relationship between the fluorescence spectra and the primary amines, and that the planar arrangements of anthracene moieties in the assemblies are closely related to the optical properties.

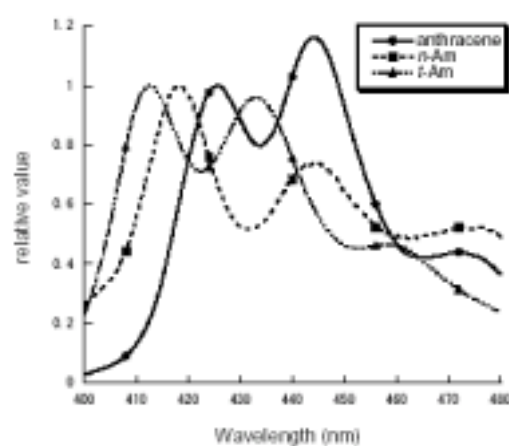


Fig. 1 Fluorescence spectra of anthracene and organic salts of ADS with *n*-Am and *t*-Am.

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