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Communication

Tunable amplified spontaneous emissions by dimensional-controlled microcrystal synthesis

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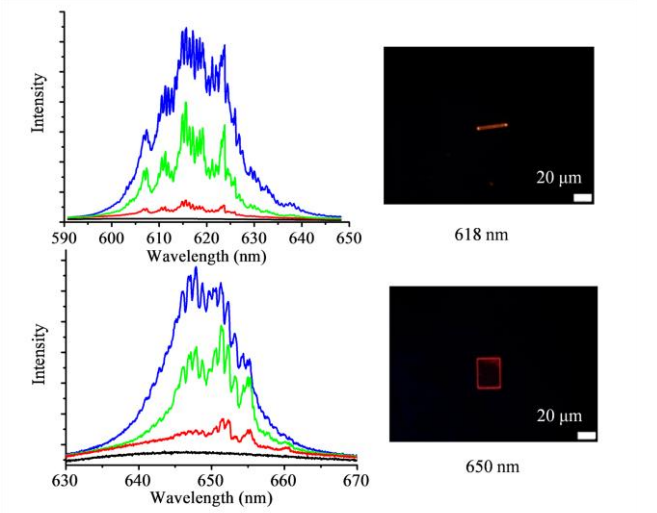
Graphical abstract



One-dimensional (1D) microwires and 2D microdisks of DMF-HPPO have been selectively prepared by controlling the solution polarity. Tunable amplified spontaneous emissions are achieved and 1D microwire demonstrates sharp splitting photoluminescence peaks around 618 nm, while 2D microdisk shows a red-shifted emission central at 650 nm.

ABSTRACT
The excited-state intramolecular proton transfer molecules based on chalcone (E)-3-(4'-dimethylaminophenyl)-1-(4'-fluoro-2'-hydroxyphenyl)-2-propen-1-one (DMF-HPPO) have been synthesized under microwave irradiation. One-dimensional (1D) microwires and 2D microdisks of DMF-HPPO have been selectively prepared by controlling the solution polarity. XRD results revealed the two microcrystals exhibit distinct diffraction patterns, which indicates that they have belonged to different crystalline nature. The microcrystals demonstrate shape-dependent amplified spontaneous emissions (ASE) that the emission of 1D microwire is central around 618 nm and the 2D microdisk emits fluorescence at 650 nm. This result reveals the controlled synthesis of two microcrystals and their consequent multicolor amplified spontaneous emission, providing considerable promise for the development and application of new opto-electronic devices.

Keywords:
Amplified spontaneous emission