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(G*) (POS-26) Atums Green: A New Phenylene-Based Conjugated Polymer and Associated Three-Color Polymer Blends.

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We synthesized a green-fluorescent conjugated polymer (CP) referred to as "Atums Green". This organic-soluble polymer had a molecular weight up to 50 kDa and featured a strong green fluorescence both in solution and in the solid state. Photophysical studies were done to explore its application in laser photonics in the green band. The PL emission has an absolute quantum efficiency as high as 98% and the time-resolved photoluminescence showed a mainly single exponential decay with a time constant of 0.74 ns, whereas in solid films the mean decay times were non-exponential and on the order of 250 ps. Atums Green moreover demonstrated superluminescence and solution-based lasing in a bulk cavity tunable between 500 and 540 nm with pump energies up to 60 μJ for pump pulses of ≈1.8 mJ. Injecting Atums Green into a microcapillary generated a set of whispering gallery lasing modes separated by 1.08 nm. The lasing output was confirmed by threshold measurements and from interference using a spatial light modulator. Solid state lasing was currently prevented due to photobleaching effects that occurred under atmosphere. We finally used Atums Green as the green component of a set of blended 3-color CP microspheres. Atums Green was mixed in various proportions with red-emitting MEH-PPV and blue-emitting MEH-PPP and then both solvent-emulsification and microfluidic methods were used to generate a set of bright fluorescent microspheres whose emission covered a wide gamut of the perceived color spectrum.

Keyword-1

Conjugated Polymers

Keyword-2

Lasing

Keyword-3

Microspheres

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