

## Synthesis and physical properties of glassy triphenyl group containing derivatives of DCM laser dye

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**Abstract:** Small D- $\pi$ -A type organic molecules which contain 4*H*-pyran-4-ylidene (pyranylidene) fragment as the  $\pi$ -conjugation system - also well known as derivatives of 4-(dicyano-methylene)-2-methyl-6-[p-(dimethylamino)styryl]-4*H*-pyran (DCM) laser dye - show potential in OLED emission layer application studies, organic solid state lasers, organic solar cells and optical chemosensors.

Additional incorporation of bulky triphenyl groups in such molecules enables the formation of amorphous structure in the solid state from volatile non-polar organic solvents, which could be of great manufacturing advantage.

Six glassy DCM derivatives with 2-*tert*-butyl-6-methyl-4*H*-pyran-4-ylidene fragment as the backbone of the molecules are described in this report. Their light emission in solution as well as in thin solid films is in range from 600 nm to 700 nm, they are thermally stable ( $T_d$  from 242°C to 312°C) and show glass transition ( $T_g$ ) from 108°C up to 158°C. The amplified spontaneous emission threshold values of the neat films of the glassy DCM derivatives vary from 155 to 450  $\mu\text{J}/\text{cm}^2$ . More detailed physical property relation with the material chemical structure will be discussed during the conference.

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