LASING CHARACTERISTICS OF β-DIKETOBORONATES

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ABSTRACT

The β-diketoboronates, (diphenylpropen-1,3-dialato)(oxalato)boron (**1**), (flavonolato)(oxalato)boron (**5**) and (flavonolato)(catecholato)boron (**6**), have the dye laser characteristics. Three other β-ketoboronates, (RCOCHCOR')(O_2CCO_2)B where (R = R' = t-butyl (**2**) ; R = methyl, R' = phenyl (**3**) and R = R' = 2-pyridyl (**4**)) do not laze. The compounds were examined for their lasing characteristics, conversion efficiency and photostability. Higher conversion efficiency was observed for **(1)** doped PMMA in the form of a slab as compared to the thin-film PMMA host. A conversion efficiency of 29% was achieved when a slab of **(1)** in PMMA at concentration 3000ppm was pumped transversely by using Nd.:YAG Laser with 355nm output laser wavelength. The highest conversion efficiency of **(5)** and **(6)** obtained in this work were 4.0% and 3.1% respectively in thin-film PMMA, The higher bathochromic shift in compound **(5)** and **(6)** was the result of conjugation.

ABSTRAK

β-diketoboronata (difenolpropen-1,3-dialato)(oxalato)boron **(1)**, (flavonolato)(oxalato)boron **(5)** dan (flavonolato)(katekolato)boron **(6)** mempunyai ciri-ciri laser. Tiga β-ketoboronata bahan yang lain, (RCOCHCOR')(O_2CCO_2)B where (R = R' = t-butil (**2**) ; R = metil, R' = fenolic (**3**) and R = R' = 2-piridil (**4**)) tidak menunjukkan aksi laser. Bahan-bahan itu telah diuji ciri-ciri laser, kecekapan pertukaran laser dan kestabilan laser. Kecekapan pertukaran laser yang lebih tinggi diperhatikan pada bahan **(1)** yang dirangkumkan dalam PMMA berbentuk kiub jika dibanding dengan yang berbentuk filem lipis. Kecekapan pertukaran pada 29% dapat dicapai dengan bahan **(1)** dalam PMMA yang berbentuk kiub pada kepekatan 3000ppm apabila teruja oleh laser Nd:YAG dengan 355nm panjang gelombang secara melintang. Kecekapan pertukaran yang tertinggi dicapai dalam penyelidikan ini bagi **(5)** dan **(6)** dalam PMMA yang berbentuk filem lipis adalah 4.0% dan 3.1% masing masing. Pengalihan bathocromic yang lebih tinggi dalam **(5)** dan **(6)** adalah disebabkan oleh konjugasi bahan itu.

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