

Development of Optical Memory Materials for DVD-Recordable

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The optical disc such as compact disc-recordable (CD-R) has been already considered for more advantageous memory media than magnetic tapes or disc due to bigger information capacity, faster access time, and longer data durability, even if it is mainly used for write-once-read-many (WORM) type disc. Last year, higher-density optical systems such as digital versatile disc-recordable (DVD-R) have been standardized and are expected to be post-disc systems after CD-R. Because the organic dye for the recording layer of DVD-R are a key component, several companies in Japan have been developing their own dye materials. These organic dyes require high molar absorption coefficients, dramatic thermogravimetric decomposition threshold, and high thermal and photochemical stability, etc. One of the most important requirements of dyes would be that they must have a suitable amount of UV absorption at a wavelength of a writing laser. The dye compounds satisfied with above requirement would be very few such as azo-metal complex and cyanine dyes, etc. Our current dye materials are based on the styryl-type dye structure because we can easily modify electron-donating or accepting groups inside the structures so that we can shift precisely the UV-vis spectra of organic dyes. We present herein the basic principle of DVD-R, new organic dye materials, optical and thermal properties, and the other representative recording characteristics at 4.7 GB DVD-R (635 or 658 nm writing). A few styryl dyes are estimated as very promising candidate materials for DVD-R disc.

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