Functional Materials 9, No.3 (2002)

Doped organic single crystals as solar energy convertes

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Received April 19, 2002

For solar energy measurements and applications it is important that no ultra violet or violet (UV) radiation is lost. There are two ways to ensure this does not happen: 1) to use wide band, but expensive photodetectors, 2) to use a cheap photodetector fitted with a light shifter (LS). This paper is devoted to a new LS based on doped crystals of *p*-terphenyl containing a highly light resistant luminophore. A major problem, which has been overcome, is the rejection of the red band of sunlight spectra, which passes through the light selecting system (filters, or surfaces with selective light reflection). The new LS can be used as converters of the sunlight UV part of red light in order to increase the efficiency of solar cells, as well as for the registration of the UV part of sunlight in biological, medical and environmental applications

В задачах измерения солнечной энергии и ее использования важным фактором является отсутствие потерь фиолетового и ультрафиолетового излучения. Есть два способа решения этой проблемы: 1) применение широкодиапазонных, но дорогих фотодетекторов; 2) применение дешевого фотодетектора вместе со сместителем спектра. В статье рассматривается новый сместитель спектра на основе допированных кристаллов *n*-терфенила, содержащего люминофор с высокой светостойкостью. Главная проблема, которую надо при этом решить, состоит в устранении красной области солнечного спектра, проходящей через систему селекции света (фильтры, поверхности с селективным отражением света). Новый сместитель спектра может быть использован как конвертор ультрафиолетовой части солнечного света в его красную область для увеличения эффективности солнечных батарей, а также для регистрации ультрафиолета в задачах биологии, медицины и охраны окружающей среды.

Anthropogenic emissions have caused a weakening of the screening properties of the Earth's atmosphere with respect to solar radiation. One result of this is an increase in the intensity and spectral range of the ultra violet and violet parts (UV) of solar spectrum, which are dangerous for health, as well as an increase in intensity of radiation in the visible short wavelength (violet-blue) region. In recent decades the lower limit of UV sunlight wavelength, which finds it way through the atmosphere, has been extended down to 220...230 nm, bringing it into a range injurious to human health. Therefore for solar energy measurements and applications it is very important not to lose the UV part of the solar spectrum. It is known that the UV-radiation absorption maximum for nucleic acids, which are the building blocks of human genetic apparatus, is in the region of 260 nm. This is clearly the reason why UV-radiation in this range results in genome damage because of photochemical damage to the DNA. Furthermore, it is the fundamental cause of an increase in skin cancer, dermatological