

液晶性を利用した光解体性接着剤

Photo-Dismantlable Adhesive by Utilizing Liquid Crystalline Properties

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Abstract

Adhesives are used in all aspects of life and have contributed to industrial development in terms of processing and operating costs, such as labor saving and weight reduction. In recent years, it has become desirable to have applications that can promote the reuse and recycling of the adhered by easily releasing the adhesion, thus contributing to resource saving. Such adhesives which can be easily separated are called "dismantlable adhesives" and are the subject of intensive research. Among them, dismantling adhesives that use light as a trigger means have been studied intensively. Because they can be irradiated without contact and with high spatial and temporal resolution, and be easily homogenized, enlarged, and curved. Another promising method is to exploit solid/liquid-crystal (LC) phase transitions to control the adhesive softness. In LC phase transitions, a large adhesive force arising from strong intermolecular interactions can be achieved. In addition, the exploitation of these transitions is an easy way to alter the adhesivity because changes in the molecular order of the LC directly alter this property. In recent years, the use of light-reactive liquid crystals in adhesives has been the focus of much research because of the potential for high-performance adhesives that incorporate these advantages. In this review, we describe several recent examples of photoinduced exfoliation of liquid crystalline polymeric materials.

キーワード：液晶、相転移、光異性化

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1. 緒言

光による接着制御は、非接触で局所的・位置選択的な光照射や高速の ON-OFF スイッチングが可能であるといった高い時空間分解能に加え、強度や波長、偏光条件など、様々なパラ

メーターを電子的に容易に制御できるという利点を有する。さらに、水中や金属材料といった熱伝導の困難な環境や生体などの損傷が懸念される対象に対しても比較的温和な条件下で進行できるといった利点を有する。これらの利点から光で接着力が向上する材料は接着やコーティング分野のみならず生体を対象とする美容、歯科、医療面などにおいても幅広く応用されてきた。その一方で、従来からの要求に加え、被着体の再利用、再使用を可能とする用途が望まれるようになってきており、接着部を容易に分離

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