

Mechanical and electrical properties of cyanoacrylate adhesives by addition of graphene and graphene nanoplatelets nanofillers

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Cyanoacrylate adhesives are of special interest because those adhesives are cured at room temperature, as well as they are able to bond a wide variety of substrates in short times. They are one-part adhesives, which cured without the addition of an initiator or curing agents. The polymerization reaction of cyanoacrylate adhesives is initiated by free radicals or nucleophiles, i.e., neutral bases or ionic initiators such as the water molecule and is stabilized through the addition of a strong acid and free radical inhibitors. When cured, cyanoacrylate adhesives generally are hard with good shear strength but are brittle with poor peel properties. To enhance their mechanical properties in terms of toughness, peel and shear strength, the most typically used are rubber based toughening agents. In addition, improve electrical conductivity of cyanoacrylate adhesives make them suitable for use in the manufacture of electronic and microelectronic components. In recent times graphene and other carbon-based nanomaterials due to its unique structure and excellent physical and chemical properties, have attracted great interest to improve the mechanical and electrical properties of the polymer resins. This experimental study was conducted to evaluate the effect of graphene and graphene nanoplatelets as reinforcement of cyanoacrylate adhesives to improve mechanical and electrical properties and the influence of the incorporation method.

References

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