

NASA TECH BRIEF

Goddard Space Flight Center



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Improved Thermally Conducting Electron Transfer Polymers

The problem:

Currently, electronic modular components encapsulated with existing polymeric materials do not dissipate enough heat.

The solution:

A newly discovered group of polymers that display excellent thermal conductivity can be used to allow rapid passage of heat. A variety of these electron-transfer polymers can be formed.

How it's done:

A group of polymers is prepared from phenol, hydroquinone, and formaldehyde. The normal phenol/formaldehyde polymers have a thermal conductivity in the range of 6 to 7×10^{-4} cal/cm-sec-°C. When hydroquinone is added a new polymer is formed. The thermal conductivity of this new compound is in the range of 1 to 2×10^{-3} cal/cm-sec-°C which is an improvement by a factor of 4 over the previous type.

Other polymers can be constructed using a multitude of different compounds. All of these new products exhibit a thermal conductivity at least twice the magnitude of that of known polymers. They are very useful as coating materials for electronic components.

Note:

Requests for further information may be directed to:
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Reference: TSP72-10291

Patent status:

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