# Article information:

Epoxy/hybrid graphene‐copper nanocomposite materials with enhanced thermal conductivity - Lopez‐Barajas - 2022 - Journal of Applied Polymer Science - Wiley Online Library
<https://onlinelibrary.wiley.com/doi/full/10.1002/app.52419>

# Article summary:

1. Epoxy resins have excellent mechanical properties, high adhesive characteristics, and high chemical stability but low thermal conductivity, which is necessary for electronic parts to prevent overheating and failure.

2. The addition of thermally conducting particulate fillers such as carbon particles (graphene, nanotubes), metals, and ceramics can enhance the thermal conductivity of polymer composites.

3. Hybrid fillers composed of two or more different simple fillers, such as graphene-copper nanocomposites, have been shown to increase thermal conductivity more than single fillers at the same concentration. Different methodologies have been employed to obtain these hybrid fillers.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

该文章主要介绍了一种新型的热导率增强材料——环氧/混合石墨烯-铜纳米复合材料。然而，该文章存在以下几个问题：

1. 偏见来源

该文章没有提及其他类型的热导率增强材料，只关注了环氧/混合石墨烯-铜纳米复合材料。这可能是因为作者与该材料有关的机构或公司有利益关系。

2. 片面报道

该文章只介绍了添加填充剂来增强聚合物的热导率，但并未探讨其他方法。例如，通过改变聚合物结构或添加表面活性剂等方法也可以提高其热导率。

3. 无根据的主张

该文章声称“晶态极大地促进了热导率”，但并未提供任何支持此主张的证据。

4. 缺失考虑点

该文章没有考虑到添加填充剂可能会影响聚合物的其他性质，如机械性能和化学稳定性。

5. 主张缺失证据

该文章声称使用混合填充剂可以比单一填充剂更有效地提高聚合物的热导率，但并未提供足够的实验证据来支持这一主张。

6. 未探索反驳

该文章没有探讨其他学者对于使用混合填充剂来增强聚合物热导率这一观点的反驳意见。

7. 宣传内容

该文章似乎旨在宣传环氧/混合石墨烯-铜纳米复合材料，并没有客观地评估其优缺点和适用范围。

8. 偏袒

该文章似乎偏袒使用环氧/混合石墨烯-铜纳米复合材料来增强聚合物的热导率，并没有客观地评估其他类型的填充剂或方法。

9. 没有注意到可能风险

该文章没有提及使用环氧/混合石墨烯-铜纳米复合材料可能带来的潜在风险，如毒性、环境污染等问题。

10. 没有平等呈现双方

该文章只介绍了作者所支持的观点，并未平等呈现其他学者对于此话题不同观点和实验结果。

# Topics for further research:

* Other types of thermal conductivity enhancing materials
* Other methods to enhance thermal conductivity of polymers
* Evidence supporting the claim that crystallinity greatly enhances thermal conductivity
* Potential impact of adding fillers on other properties of polymers
* Experimental evidence supporting the claim that using a mixture of fillers is more effective than a single filler
* Counterarguments to the use of a mixture of fillers to enhance thermal conductivity of polymers

# Report location:

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