# Article information:

Super Strengthening Nano‐Polycrystalline Diamond through Grain Boundary Thinning - Yao - Advanced Functional Materials - Wiley Online Library  
<https://onlinelibrary.wiley.com/doi/full/10.1002/adfm.202214696>

# Article summary:

1. Nanopolycrystalline diamond (NPD) has superior properties due to nanoscale grains, but the effects of grain boundaries on mechanical properties are not well understood.

2. The addition of fullerene during HPHT sintering can reduce intergranular amorphous nanodomains and create thin amorphous grain boundaries in NPD, leading to enhanced hardness up to ≈150 GPa.

3. Understanding the roles of disorders in GBs and intergrains is important for manipulating the properties of NPD and may provide another engineering approach for property manipulation.

# 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:

该文章主要介绍了通过晶界细化来增强超硬纳米多晶金刚石的方法。文章提到了纳米多晶材料具有优异的性能，如各向同性和更高的硬度，但并未提及其可能存在的缺陷和风险。此外，文章对于不同制备方法得到的纳米多晶金刚石硬度变化进行了介绍，但并未深入探讨其原因和机理。文章还提到了晶界对于NPD力学性能的影响，但是对于这种影响机理仅仅是在文中简单地提及，并没有进行详细阐述。

总体来说，该文章存在一定程度上的片面报道和偏袒现象。虽然文章提供了一些实验结果和理论分析，但是缺乏全面、客观、科学的考虑。同时，在介绍纳米多晶材料时也应该注意到其潜在缺陷和风险，并且需要更加深入地探讨其制备方法和机理。

# Topics for further research:

* Potential defects and risks of nanocrystalline materials
* Mechanisms behind the changes in hardness of nanocrystalline diamond obtained by different preparation methods
* Detailed explanation of the influence of grain boundaries on the mechanical properties of NPD
* Comprehensive and objective consideration of the topic
* In-depth exploration of the preparation methods and mechanisms of nanocrystalline materials
* Balanced reporting of both advantages and disadvantages of nanocrystalline materials

# Report location:

<https://www.fullpicture.app/item/39e60bc5b2b2f80c6ad44e23e6012a9c>