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Preliminary research indicates that Rockstone graphite is hexagonal, very fine-grained and exhibits turbostratic (rotated layer) disordering. Rockstone graphite crystal sizes viewed so far range up to a size of 50 microns long X 20 microns wide but most appear to be 10 microns or less.

According to Microsoft CoPilot, turbostratic graphite is important due to its unique properties and potential applications:

1. **Electrical Properties:** Turbostratic graphene, a form of turbostratic graphite, has electrical properties similar to those of monolayer graphene due to the low interlayer interaction¹. This makes it a promising material for applications in electronics.
2. **Resistance to Impurities and Surface Roughness:** The stacking structure of turbostratic multilayer graphene can decrease the effect of attachment of charge impurities and surface roughness¹. This property enhances its performance in various applications.
3. **Lubrication:** Turbostratic graphite has a significant crystalline disorder (turbostraticity) which makes it a potential additive for lubricating oils due to its greater propensity to easily shear due to weak interatomic interactions between layers².
4. **Energy Storage:** Turbostratic graphite materials show excellent cycle performance, high capacities comparable with the theoretical capacity of 372 Ah kg⁻¹, and coulombic efficiencies of higher than 90%. Therefore, graphite is commercially used as the negative electrode of most Li-ion batteries³.
5. **Ease of Work:** The new method of producing turbostratic graphene results in misaligned layers that make it easy to break apart. This form of graphene is far easier to work with, allowing it to be used in a broader range of applications⁴.

Turbostratic Graphite Applications

Turbostratic graphite has a wide range of applications due to its unique structure and properties. Here are some of them:

1. [**Sensors:** Turbostratic graphite can be used in the development of various types of sensors¹.](#)
2. [**Composite Strengthening:** It can be used to strengthen composite materials¹.](#)
3. [**Hydrogen Storage:** Turbostratic graphite is used in hydrogen storage systems¹.](#)
4. [**Lithium-ion Batteries:** It plays a crucial role in the performance of lithium-ion batteries¹.](#)
5. [**Lubrication:** Turbostratic graphite is used as a lubricant in highly loaded tribological contacts².](#)
6. [**Oil Additive:** It is used as an oil additive in self-lubricating iron-based composites³.](#)

These applications leverage the unique properties of turbostratic graphite, such as its specific disordering of graphene layers and high defect tolerance.

Turbostratic graphite is used in batteries. [It's particularly beneficial in lithium-ion and aluminum-ion batteries due to its unique properties¹²³.](#)

[In lithium-ion batteries, the carbonaceous matrix formed by turbostratic graphite-like carbon can accommodate the volume change of Si nanoparticles, enabling the full lithiation of Si and improving the battery capacity⁴.](#)

[In aluminum-ion batteries, turbostratic graphene, a form of turbostratic graphite, has been used as a cathode material for enhanced performance compared to graphite and orderly-stacked graphene cathodes³. The turbostratically disordered structure with high density of defective sites and largely expanded spacing allows for efficient ion \(de\)-intercalation kinetics, leading to high specific capacity, rate capability, and cyclic stability².](#)