

What is Graphene?

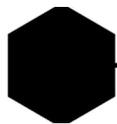
History

Graphite, the 3-dimensional cousin of graphene, had been known for a long time and scientists have always theorized that graphene could be isolated from it in a 2-dimensional form. It wasn't until recently in 2004 that two scientists, Andrew Giem and Konstantin Novoselov at the University of Manchester, created the first sample. The two scientists had been polishing a sample of graphite with tape until they noticed extremely thin flakes on the tape. This inspired them to create thinnest sample possible and as a result, created Graphene. This discovery took the scientific world by storm and in 2010, the two scientists won the Nobel Peace Prize.

Properties

Graphene is as critical to human civilization as Bronze, Iron and Plastics. Its potentials have specialists dubbing graphene as a "supermaterial". Once Graphene can be produced at a large scale the world of Physics and Engineering will open up to a new era of advancements.

What makes graphene so amazing is its properties. It's over 100x stronger than steel, amazingly thin (only one atom thick), almost completely transparent, extremely light, and a perfect conductor of electricity and heat. The strength is so miraculous, it was found that even 2 atomic layers of this material can even be bullet proof. These properties make graphene ideal for all kinds of electronic application and beyond. The limit to graphene is our own imagination.

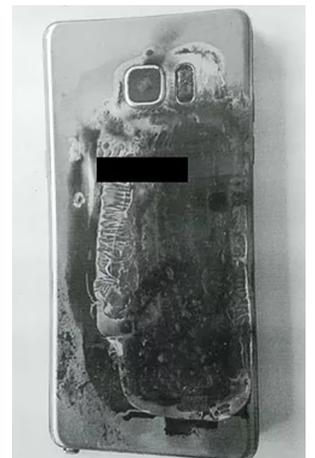


REAL GRAPHENE vs. Lithium Batteries

Why are current lithium batteries so limited?

Heat is the number one major cause. As the device begins charging, heat is generated based on resistivity of conductor. Generated heat increases the resistivity of conductor. Since the conductor is hotter, the resistivity is higher which means the device charges even more heat. This creates a positive feedback loop that can spiral out of control and cause the battery to **catch on fire**.

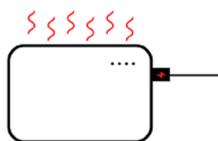
To prevent this, batteries will regulate the speed of charging but this results in battery charging speeds slowing to a crawl.



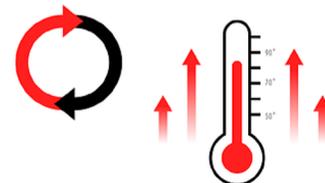
Charging begins



Higher resistivity generates heat



Generated heat increases resistivity of conductor



What are the benefits of using Graphene composite?



Graphene is a near perfect conductor of electricity. This allows electricity to flow without hindrance. This dramatically slows the heating process lithium batteries face while allowing charging speeds up to 5 times as fast. This also increases the battery life by 5 times the charging cycles.



Graphene also evenly disperses heat acting as a cooling system. Graphene already generates less heat due to extremely low resistivity. But graphene also conducts heat evenly across battery to help cool the battery.