

# Graphene Beyond Academic Markets

---

**Avery T. Luedtke**

Jia Choi, Adelina Braun, Peng Gao

*MilliporeSigma, 6000 N. Teutonia Avenue,  
Milwaukee, WI 53209 USA*

[avery.luedtke@sial.com](mailto:avery.luedtke@sial.com)

---

Two-dimensional (2D) carbon based materials such as graphene, graphene oxide, and reduced graphene oxide are unique and versatile materials that have been studied for use in applications as varied as polymer composites, drug delivery, and energy storage to name a few. [1][2] Although thousands of studies on graphene materials have been published, the potential of graphene remains largely out of reach for commercial markets. In order to enable graphene research to be applied to the manufacture of consumer products, feasible production methods at a scale that is cost competitive compared to existing technologies must be developed.

In this talk, insights into the graphene products that MilliporeSigma offers will be presented, as well as potential consumer applications of 2D carbon materials. Issues regarding the synthesis of graphene oxide from gram quantities for academic use to kilogram quantities for commercial use will be addressed. Additionally, the emerging market of non-carbon based 2D and layered materials will be discussed highlighting the unique challenges and potential of these materials relative to graphene.

---

## References

---

- [1] Haddon, R. C. ed., Accounts of Chemical Research, 46 (2013) 1–189
- [2] Haddon, R. C. ed., Accounts of Chemical Research, 46 (2013) 2191–2340.