

# Layer-By-Layer multilayer assembly of Graphene oxide with Keggin-type Polyoxometalates for electrocatalysis of Chloroform

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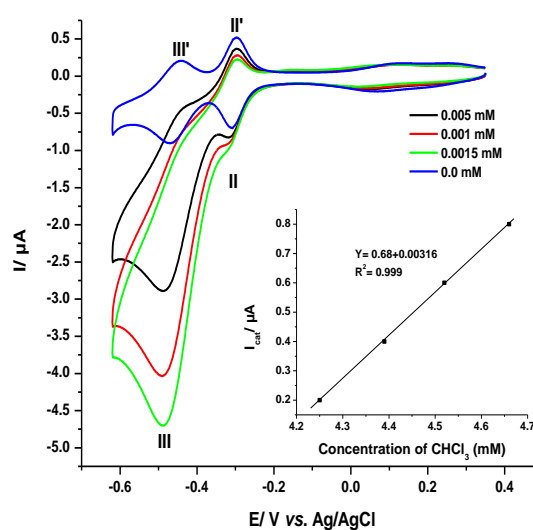
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## Abstract:

Multilayer assemblies of the Keggin-type POM [H<sub>4</sub>SiMo<sub>12</sub>O<sub>40</sub>] and Graphene Oxide (GO) have been immobilized onto glassy carbon electrode surfaces via the layer-by-layer (LBL) technique employing the PEI as the cationic layer. Resulting thin films were characterized by different electrochemical and surface techniques. The redox behavior of both the immobilized POM and the Graphene oxide are observed. The resulting films were found to be highly conductive through the employment of AC impedance. It exhibited significant electrocatalytic properties towards the reduction of chloroform in water (as shown figure 1).

## References

- [1] D. Koh, R. P. Lively, *Nature Nanotech.* 10 (2015) 385-386.
- [2] W. J. Andrzej, R. P. Piotr, L. Tomasz, S. S. Kurek, *Electrochemistry Communications.* 10 (2008) 1856-1859.



**Figure 1.** Cyclic voltammogram of the multilayer assembly of GO/PEI/H<sub>4</sub>[SiMo<sub>12</sub>O<sub>40</sub>] (outer anionic layer of POM) in buffer solution pH 7.0, before (0.00mM) and after addition of chloroform (0.002mM, 0.005mM, 0.001mM) at a scan rate of 10 mVs<sup>-1</sup>. The inset shows the relationship between the catalytic current (I<sub>cat</sub>) and the chloroform concentration for the Mo-III wave.