

Scaling up Production of Graphene Oxide

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Abstract

Since our safe production process for graphene oxide and reduced graphene oxide was established in 2015 (Fig. 1), several improvements have been implemented, including shorter time, lower metal contents and much improved reproducibility. Based on these improvements we are now scaling up production to meet increased demand in the market. Our present production line is built for 1.1 Kg batch size with a theoretical yearly capacity of 800 Kg, but has until now been run only once on working days. The new line will have a reactor with capacity to produce 3 Kg GO per batch and several functions that have been controlled manually in the old line are now being automated. This line will be operational in October this year. In a next stage, the line will be fully automated so that it can be run 4 cycles per 24 h., to be implemented in 2021. We then plan to increase to 6 Kg per batch as a maximum. Further scale-up will be done by setting up additional lines side by side. In the first stage now being implemented, production cost will be cut by about 50 %. Recently we have seen increasing demand for de-acidified graphene oxide, so also the extended washing with de-ionized water needs to be scaled up and automated, all in response to demand.

Workflow Production of Graphene Oxide (GO) and Reduced Graphene Oxide (RGO)

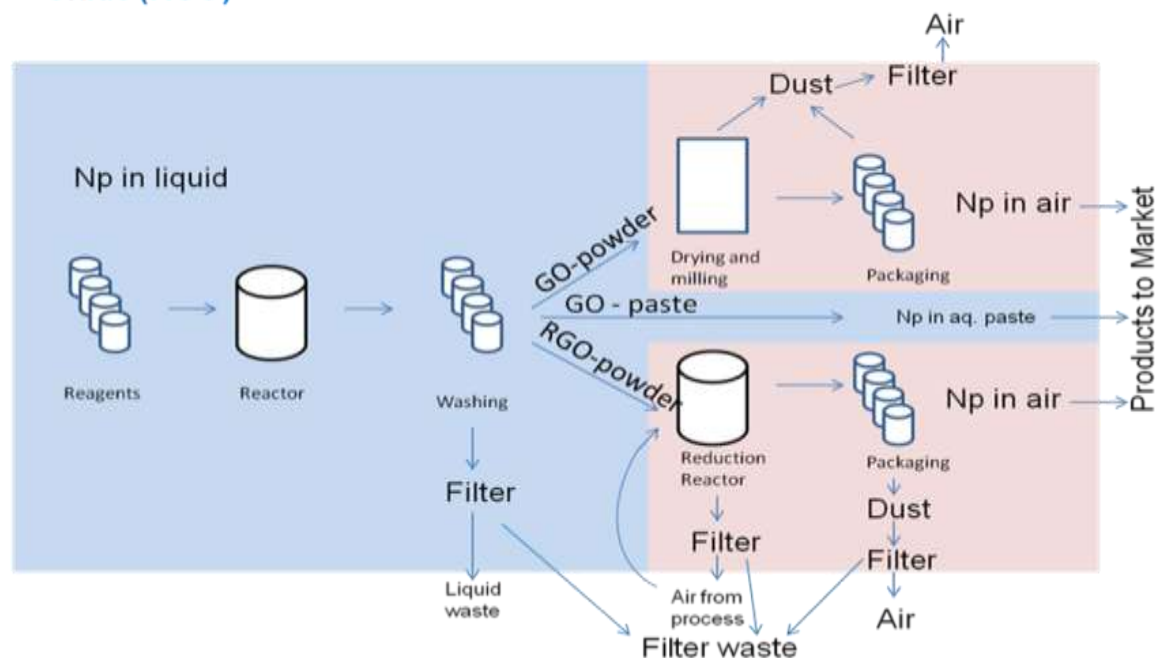


Figure 1: Schematic illustration of our production process from 2015