Corning® Advanced-Flow™ Reactor Webinar Series
Webinar 7: "Stepping into Corning® Advanced-Flow™ Reactors: Application in Material Sciences via Nanoparticles Synthesis"
Tuesday, Mar. 11 – 9am Central European Time | Thursday, Mar. 13 – 11am Eastern Standard Time

Questions & Answers

Q1: How did you remove the gold coating in the example of the G3 reactor?

The use of Aqua Regia (hydrochloric acid and nitric acid) allowed us to perform the safe removal of gold mirror deposit.

Alternatively, the Aqua Regia was made in situ by combining both reagents within the plates.

Q2: Is it possible to analyze nanoparticles in flow?

Yes, it is possible to perform a number of analyses in flow, although in this case you'll also want to analyze the final results in batch. For instance, UV can give a good indication of the size profile of nanoparticles and this can be performed in flow.

Q3: Which wavelength was used in the case of the gold nanoparticle example?

The wavelengths were assessed to select the most effective wavelength to trigger the reaction. In this particular case, 405 nm was selected and used at all scales to perform the synthesis in flow.

Q4: How long did it take to fine tune the process parameters to scale up to G3?

Using the conditions from the Lab Photo Reactor and the G1 Photo Reactor, the optimal conditions had already been assessed. The scale up in G3 itself was run within two or three days, not requiring real optimization but rather tuning the conditions.

Q5: At the beginning, you mentioned it is possible to separate the nanoparticle nucleation from the growth. Can you detail more?

Within one reactor, it is possible to have the nucleation process performed in one plate and the growth in a separate plate if both processes require different conditions such as temperature/wavelength.

Q6: Do you have data regarding the engineering side of nanoparticles synthesis in your reactors?

We have more data on the engineering part of our reactors. A paper was recently released (https://www.sciencedirect.com/science/article/pii/S1385894721001649) and will be presented in an upcoming webinar, "Continuous Manufacturing of Nanostructured Materials in a Corning® Advanced-Flow™ Reactor" on Tuesday, May 18, 2021. Click here to register.

Dr. Kejun Wu, Zhejiang University will provide a more in-depth analysis of how nanoparticles can run in our reactors and why Corning's Advanced-Flow Reactor Technology is capable of achieving high precision.

Q7: How hard is it to transition from batch synthesis to flow specifically with nanoparticles?

We have a webinar that covers this topic: "How to Analyse your Batch Process Data to Transition from Batch to Flow" that you can view here. You can access our other recorded webinars on our website, www.corning.com/AFRwebinars.

In the case of nanoparticles, the synthesis is very sensitive to all parameters and the surface of the reactor has to be taken into account as it will likely have an effect on the synthesis. This aspect should not be overlooked.

For the other parameters, they should normally translate, but keep in mind changing equipment might require more work than initially predicted.

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