

## Exfoliation of graphite in a Taylor–Couette fluidic device with double inner cylinders

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For the preparation of graphene, mechanical exfoliation using a shear force in a liquid phase attracted attention due to its advantage such as low cost and scalability. In this work, we suggest a double inner-cylinder Taylor–Couette (TC) fluidic device to increase a shear force compared to the single inner cylinder TC fluidic device. It consists of two independently rotating inner cylinders and stationary outer wall. Investigation on the complex flow in the double inner cylinder system was carried out by numerical simulation to effectively utilize the double-cylinder apparatus for the graphite exfoliation. Effect of the device structure and operating condition on the flow was studied using a commercial CFD software, ANSYS FLUENT v201 including vertical length at the center, distance between the two inner cylinders, and the rotating speed and direction of the inner cylinders. Based on the simulation, a TC fluidic device with double inner cylinders was fabricated and the exfoliation of graphite in the double-cylinder TC fluidic device was performed to confirm enhanced graphite exfoliation efficiency.