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## Annealing effect on the ferromagnetism of MoS<sub>2</sub> nanoparticles

S.Ahmed<sup>1</sup>, P. Viboon<sup>1</sup>, X. Ding<sup>1</sup>, N.N Bao<sup>2</sup>, Y.H Du<sup>2</sup>, T.S. Heng<sup>3</sup>, J. Ding<sup>2</sup>, and J.B. Yi<sup>1\*</sup>

1. School of Materials Science and Engineering, UNSW, Sydney, NSW 2052, Australia.
2. Department of Materials Science and Engineering, National University of Singapore, 119260, Singapore.
3. Institute of Chemical and Engineering Science, Agency for Science, Technology and Research (A\*STAR), 1 Pesek Road, Jurong Island, 627833, Singapore.

### Corresponding Author:

\*Dr. Jiabao Yi (J.B.Yi)

[\\*jiabao.yi@unsw.edu.au](mailto:jiabao.yi@unsw.edu.au)

### Abstract

Novel properties of two-dimensional (2D) materials have drawn extensive attention in past decade. Magnetic property is one of the research focuses since it can add extra spin freedom for the manipulation of 2D material properties. The magnetism in 2D materials can be originated from defects (i.e. vacancies, zigzag defects). In this work, MoS<sub>2</sub> nano particles were annealed at various temperatures (from 600 till 1000 °C) in an argon environment to explore the post-annealing effect on the magnetic properties. The results indicate that annealing may induce tunable ferromagnetism associated with the annealing temperature. The ferromagnetic signal is enhanced with the increase in annealing temperature which may attribute to the defects pertaining to the sulfur vacancies and edge terminated structure induced by annealing.

**KEYWORDS:** *Two-dimensional Materials; Transition metal dichalcogenides (TMDCs); Annealing; Magnetic properties; Ferromagnetism; Diluted magnetic semiconductor (DMS)*

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