Review of: "Ti2N nitride MXene evokes the Mars-van Krevelen mechanism to achieve high selectivity for nitrogen reduction reaction"

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Potential competing interests: The author(s) declared that no potential competing interests exist.

In this manuscript, the authors reported on ambient electrochemical nitrogen electroreduction to ammonia over on two-dimensional (2D) Ti2N nitride MXene as an efficient and durable catalyst. The prepared Ti2N-MXene catalysts were fully characterized and theoretically analyzed toward the NRR. Impressively, the best catalyst showed a very high NRR performance with an exceptional Faradic efficiency of 19.85%, surpassing nearly all the reported NRR catalysts. In addition to high performance, Ti2N-MXene also exhibited a high electrochemical stability during long-term electrolysis and recycling test. The detailed Mars-van Krevelen (MvK) mechanism were also studied in detailed. Overall this manuscript is interesting, the characterizations were carefully performed and the results were clearly demonstrated. Therefore, I recommend the acceptance of this paper after the minor revisions, with below points to be addressed:

1） Introduction section: to put this work into broader contents, more recently MXene-based NRR catalysts can be cited: 10.1002/aenm.202103022, 10.1002/smll.202102363, 10.1039/d1ta03662a.

2） NOx detection (NO2-, NO3- , NO or other NxOy) –NOx contamination in the used N2 feeding gas will cause a false positive result. The authors have to provide detailed analysis about the presence of NOx contaminants using chromatographic methods.

3） It is better to offer the photograph of electrochemical setup for NRR test in Supporting Information.

4） The performance comparison between current Ti2N-MXene and those state-of-the-art Ti2N-MXene catalysts for the NRR should be listed in a Table.

5） Catalyst structure after stability test should be characterized, such as phase, morphology and chemical states.