

Comment on the Ammonia Synthesis Activity of Rhenium

In a recent paper by Spencer and Somorjai (1), it was reported that polycrystalline rhenium appears to be more active as an ammonia synthesis catalyst than iron. Although we have no objection to their results; their paper carries a misleading statement on our previous paper (2) that Ozaki *et al.* found, "in contrast to the present study, that a rhenium catalyst (finely divided rhenium on coconut carbon) was inactive at temperatures up to 400°C. Presumably their detector system was not sensitive enough to register the small amount of ammonia." We would like to remove their misunderstanding by the present letter.

Our finding of inactive Re/carbon catalyst is not inconsistent with their finding of active unsupported rhenium, because, not only rhenium, but all the known active metals including iron and ruthenium lose their activities for ammonia synthesis when supported on carbon even after an extensive reduction with hydrogen (2, 3). The lack of activity is undoubtedly traced back

to the carbon support, presumably because of the electron withdrawal by carbon, as evidenced by the reactivation by added potassium (3). Moreover, our detector system was based on a trapping of ammonia in a circulating loop at 78°K, in contrast to 113°K adopted by Spencer and Somorjai, so that it was sensitive enough to detect the small amount of ammonia.

REFERENCES

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