REDUCTION OF DINITROGEN IN SEMICONDUCTOR SUSPENSIONS

J.M.S. Bandara
Junior Research Associate

The general objective of the research was to find out a new catalyst system for the photoreduction of dinitrogen.

The following systems have been studied:

1. H_2WO_4-coated TiO_2,
2. hydrated $MnO(OH)_2/Fe(OH)_3$,
3. ZnO/Fe_2O_3,
4. $MgO/Fe(OH)_3$,
5. $SmCl_3/Fe(OH)_3$,
6. WO_3 coated with transition metals (Cu, Fe, Cr, etc.), and
7. TiO_2/MoO_3.

To increase the yield, optimization of the catalysts was done as follows:

1. pH variation of the medium,
2. dopant amount variation,
3. variation of heating time/temperature of the catalysts, and
4. irradiation time variation.

After the optimization of the catalyst, XRD spectrum analysis, DTA studies, UV-visible spectrum analysis, and particle-size analysis were done to interpret the experimental results. Water splitting was studied by H_2 evolution. This was done for several systems with the use of the Gas Chromatograph.

Out of those systems, some were inactive (3, 4, 7). From among the active systems, the 1st, 2nd, and 5th studies were completed. Others are still under investigation.