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Thermodynamics of toxic gas molecules on metal oxide nano powders[1] JAE-YONG KIM, IK-JAE LEE, Beamline Division, Pohang Accelerator Laboratory, Pohang, Korea, CHAE-OK KIM, Department of Physics, Hanyang University, Seoul, Korea, BEAMLINE DIVISION, POHANG ACCELERATOR LABORATORY, POHANG, KOREA COLLABORATION, DEPARTMENT OF PHYSICS, HANYANG UNIVERSITY, SEOUL, KOREA COLLABORATION — Studies on physical/chemical reactions of gas molecules on nano sized metal oxide powder surface is interesting because the results from the research can directly be applied to the investigation of the surface mediated catalytic reactions aimed at reducing atmospheric pollutants. Thermodynamic properties of nitrous oxides (NO_x) on varies nano sized metal oxides such as MgO and ZnO powders were studied using a computer controlled gas adsorption isotherm apparatus, which has good temperature stability within 0.01K in a wide rage and good pressure accuracy with a resolution better than 10^{-5} torr in 100 torr. A set of isotherms below the triple points of the nitrous gas was measured. A specific surface area of particles was also obtained from calculations of a molecular area of adsorbate gas on the surface of the adsorbents. The thermodynamic results including compressibility and isosteric heat of adsorption of nitrous gases on various metal oxide surfaces will be presented.

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