

DEVELOPMENT OF CARBON-BASED ADSORBENT FOR SEPARATION OF IMPURITIES SUCH AS SILOXANE AND AMMONIA FROM LAND-FILL GAS

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Land-fill gas or bio-gas is composed of large portion of methane and carbon dioxide, and small amount of impurities such as nitrogen, oxygen, hydrogen sulfide, siloxane and ammonia. These gases can be used as a gas-fuel after upgrading treatment. For the application of the land-fill gas and bio-gas as a fuel, we developed highly-performing carbon-based adsorbent which can separate siloxane and ammonia residue from these gases. It was quite necessary to consider the chemical properties of siloxane and ammonia for development of suitable adsorbent of each component. The siloxane can be polymerized in acidic or basic condition to form bulkier species which causes adsorbent deactivation and difficult regeneration. The ammonia gas is well known as basic molecules which have strong affinity to acidic species. In these reasons, we prepared neutral carbon materials by various methods for siloxane adsorption. In addition, we developed carbon-based basic ammonia-adsorbent by simple methods such as the chemical treatment of commercial activated carbon or the impregnation of organic molecules into the activated carbon. And then, adsorption-desorption isotherms and breakthrough curve of siloxane and ammonia were measured for thus synthesized adsorbents. Detail results for synthesis and the adsorption measurement of the studied adsorbents will be presented in the conference.