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ABSTRACTS BOOK

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Uptake capacity of adsorbent materials derived from municipal solid waste for CO_2 capture at post-combustion condition

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1. Introduction – The global climate change, as well as the accumulations of solid waste on landfills, are two of the primary issues nowadays, which it needs the significant attempts to reduce the impact on the ecosystem and environment from both of them [1]. In this work, the production of materials from organic solid waste is considered to produce adsorbent materials, which are assessed in the CO_2 capture.

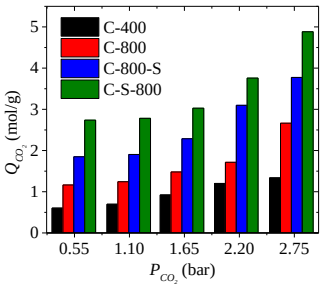

Figure 1. Uptake capacities of prepared materials for CO_2 adsorption at 40 ºC.

2. Experimental – The compost used was obtained in mechanical biological treatment plants for municipal solid waste, supplied by the company "*Resíduos do Nordeste, EIM*". In order to homogenise and remove the soluble compounds and suspended solids, the compost was first mixed with water and washed. Then, two different materials were prepared by carbonization at 400 (C-400) and 800 ºC (C-800). In addition, following the procedure previously described [2], two materials were prepared with H_2SO_4 before and after the carbonization at 800 ºC (C-S-800 and C-800-S, respectively). Then, breakthrough measurements of CO_2 carried by He at different partial pressures and post-combustion conditions (40-100 ºC) were conducted.

3. Results and Discussion – Figure 1 shows the adsorbed volume of CO_2 (Q_{CO2}) with the four samples at 40 ºC. As can be observed, the increment in the temperature calcination and the activation with H_2SO_4, lead to a higher adsorption capacity. The sample C-S-800 shows the higher uptake capacity, which is comparable with commercial adsorbents [3]. The result may be ascribed to its textural properties.

4. Conclusions – The CO_2 capture by using adsorbents prepared from organic solid waste was proved to be a solution for two current problems.

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