Choma, J., Osuchowski, L., Jaroniec, M. Properties and Applications of Activated Carbons Obtained from Polymeric Materials. *Ochrona Srodowiska* 2014, Vol. 36, No. 2, pp. 3–16.

Abstract: Results of studies on the synthesis, characterization and applications of activated carbons from polymeric materials, including polymer wastes, were presented. The major methods of polymer carbonization were described as well as of their activation by different activators such as KOH, CO_2 and H_2O. Carbons of very good porous structure parameters could be obtained from sulfonated styrene-divinylbenzene resins and polyvinylidene chloride but also from polyethylene terephthalate that represents polymer wastes. Methods for physicochemical characterization of activated carbons obtained from polymers were briefly presented, mainly in relation to their adsorption properties. One of the best activated carbons obtained from sulfonated styrene-divinylbenzene resin had the specific surface area close to 4000 m^2/g, total pore volume of about 2.1 cm^3/g and could adsorb 40 wt % CO_2 per 1 gram of carbon at 0°C and under the pressure of 1 bar, and also 4 wt % H_2 per 1 gram of carbon at –196°C, under the pressure of 1 bar. Potential applications of these activated carbons for adsorption of CO_2 and H_2 as well as CH_4, C_6H_6, NO, CO, O_2, SO_2 and NH_3 were also presented. Activated carbons obtained from polymer wastes could also be used for adsorption of dyes, herbicides, trace metal ions from water as well as adsorption of volatile organic compounds from the air. Attempts at the use of activated carbons for battery electrode and supercapacitor construction are also interesting. Activated carbons from polymeric materials attract a lot of attention due to their high specific surface area and large pore volume combined with large-scale and low-cost production.

Keywords: Polymer precursor, carbonization, activation, active material, adsorption.