robbing. However, there are very few studies [14-15] on preg-robbing by silicates because most of them are limited to carbonaceous substances and sulfides as most common and well-documented preg-robbing materials.

Ref. [16] reports an investigation on the sorption of gold by activated carbons from bromo-bromide, chloride-hydrochloride and thiourea solutions. The effect of the solution composition, temperature, and pH on the kinetics of gold sorption from halide solutions is followed aiming to identify the corresponding adsorption isotherm. The possibility of gold desorption from activated carbons is also studied.

Chlorination for extraction of gold is at present used only on a small scale. This is done mainly in cases where gold is present together with other precious metals [17]. However, due to the growing environmental problems associated with the use of cyanide during gold processing, the interest to the usage of non-cyanide leaching agents including chlorides has increased again [18-20]. Despite the urgency to determine the gold recovery efficiency, the preg-robbing mechanism valid in chloride leaching systems has not yet been elucidated. S.Mohammadnejad and J.L.Provis [21] study the behavior of four common preg-robbing minerals in chloride solutions. The effect of the values of the pH, the silicate concentration and the interaction time during the adsorption of gold is considered. Possible mechanisms are advanced.

Only a few publications treat the effect of the metal ions present on the adsorption of gold on activated carbon [22, 23]. The U.S. Bureau of Mines reports results [22] of batch equilibrium contact experiments aiming to examine the ability of an activated coconut-shell carbon to adsorb various metal cyanide complexes. Tests are also conducted to determine the effect of the cyanide complex impurities present on the adsorption of gold. The metal cyanide species investigated refer to those of antimony, arsenic, cadmium, calcium, cobalt, gold, iron, mercury, nickel, silver, thallium, and zinc. The tests are conducted in a pH range from 6.4 to 12.5. The carbon adsorbent studied exhibits a preference in respect to gold adsorption over other metals species present in the solution. The metal cyanide complexes are adsorbed in absence of gold. The adsorbed amount generally decreases with the pH increase. However, the adsorption of calcium and thallium cyanide complexes increases with the pH increase, while that of arsenic and iron cyanides are not adsorbed at any pH. The presence of gold cyanide decreases the adsorption of antimony, calcium, cobalt, iron, mercury, and silver cyanide complexes, but increases that of cadmium, nickel, thallium, and zinc specis.

Three types of an adsorption capacity are used [24 - 26]. They refer to a static equilibrium capacity, a dynamic equilibrium capacity and an useful capacity. The static equilibrium capacity corresponds to the water capacity of a new (fresh) solid desiccant (usually expressed in weight percents) determined in an equilibrium cell at a fixed temperature and 100 % relative humidity. The dynamic equilibrium capacity refers to the water capacity of a solid desiccant through which a fluid is flowing at specific values of the flow rate, the temperature, and the pressure. The useful capacity corresponds to the designed capacity accounting for the loss of the solid desiccant capacity with time due to the fact that the total desiccant bed cannot be fully utilized. The static adsorption capacity is greater than the dynamic one. The dynamic equilibrium loading generally amounts to 50%-70% of the static equilibrium capacity. The static adsorption capacity is the maximum theoretical capacity of the desiccant and can be used for the comparison of the different desiccants, while the dynamic adsorption capacity is used to calculate the required filling amount of the adsorbents [25].

The present work describes the development of novel carbon sorbents obtained on the basis of carbonized apricot stones. The main properties of the resulting materials such as their sorption ability with respect to a number of heavy metal ions are studied.

EXPERIMENTAL

A chemical method of a gold sorption investigation

The gold sorption was carried out under static and dynamic conditions using the method described in ref. [27]. The static mode experiments were carried out as follows. A sorbent sample of 0.2 g was placed in a 50 ml glass and 10ml-25ml of the studied Au^{+3} solution of a certain concentration were added. The mixture was stirred with a magnetic stirrer for a predetermined time from 1min to 90min. Then the solution was filtered through a filter with a yellow tape. The chemical analysis of the filtrate in respect to Au^{+3} content was carried out by an atomic absorption spectroscopy (Perkin Elmer AAnalyst 200, USA).