Evaluation of the pollution in the agricultural grounds irrigated by waters: Case Of The High Valley Of Oued Bounamoussa, Algerian Northeast

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The pollution represents a severe problem for the environment because of the discharges cross-posted in rivers and ponds hillsides. Under the influence of the continuous activity of the People), the ground receives and absorbs wastes which form the pollution of subterranean waters. The region of El Tarf is extremely situated northeast Algerian.

With the aim to know the current state of the quality of waters in the region of the Algerian northeast, we led a study which concerns the quality of waters and the grounds of the agro-system of the plain of Bounamoussa situated in the wilaya of El Tarf which is an essentially rural zone where water resources are strongly requested for agricultural activities.

The evaluation of the analyses of grounds and waters in the various points of observation was the object of a treatment of data realized during a cycle allowed to notice that waters of the plain of Bounamoussa are of an even strong average salinity, generally suiting in the irrigation of the tolerant cultures in salts on well drained grounds, very sensitive to the variations of the chemical aspect connected to the irrational use of artificial fertilizers. The evolution of the salinity must be however controlled.

That is why it is imperative, in front of a susceptibility of pollution such as the agricultural irrigation of waters of the plain, to estimate the contents of these chemical elements in the ground, to appreciate really the scale of the risk as well as for knowledge the origins of the contamination of waters of the plain under the influence of the impact of waters of Oued Bounamoussa.

First-principles modeling of hydrolysis reactions for nuclear waste glass forms

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First-principles informed models of dissolution behavior of glass waste forms in aqueous environments can potentially can have potentially lead to reduced uncertainties in predictions of long-term behavior. As a starting point, we have developed a model using a well characterized crystalline aluminosilicate (orthoclase) that has a known structure, but possess key characteristics of waste form glass, such as compositions with multiple cations, pH dependence and formation of secondary phases in dissolution. A Kinetic Monte Carlo study based on first-principles calculations of barriers for water reactions at neutral, protonated and deprotonated sites provided information on the overall dissolution rate and rate-limiting steps. The dissolution rate far from equilibrium is compared to experiments. We have also extended this approach to multi-component glasses, where we calculated reaction energies and barriers from first-principles. Insights into the molecular-level mechanisms of glass dissolution will be used for a coarser scale modeling. This work is aimed at better understanding of the dissolution behavior and development of predictive models for dissolution rates.

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