KONWERSATORIUM INSTYTUTU FIZYKI UMCS

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„Noble gases in water: from dating to palaeoclimate”

In geochemistry, noble gases have been used in numerous research areas since many decades. As these inert gases might be found in almost every solid, gaseous and liquid material, hence they can be detected in surface water as well as groundwater. When precipitation infiltrates the surface, atmospheric noble gases are being dissolved into the water according the prevailing atmospheric pressure and the soil temperature. Along the flow path of the recharge water, the solubility component of the noble gas concentrations do not usually change.

However, there are physical processes influencing the components of certain noble isotopes. The tritium isotopes of groundwater decay to ^{3}He, while the alpha-emitting isotopes of uranium and thorium series in the ambient soil and rock matrix produce ^{4}He, as the crustal component of terrigenic helium. These latter effects can be used in dating of groundwater in the time scale from months to millions of years. Additionally, the solubility concentrations of the noble gases are often used to calculate recharge temperatures that can be used in palaeoclimate studies.

The presentation will give an overview of the applications of noble gases in groundwater geochemistry, including examples and measurement techniques.

Uprzejmie zapraszam wszystkich pracowników, doktorantów i studentów Instytutu Fizyki.

Zbigniew Korczak