



## The tritium, deuterium and oxygen-18 isotope levels determination in various waters in Rize and Trabzon

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### ABSTRACT

Rize and Trabzon are provinces at north-east site of Turkey, on the eastern Black Sea coast. There has been no information about isotopic  $\delta^{18}\text{O}$ ,  $\delta\text{D}$  and tritium determination reported in water samples in the Rize and Trabzon provinces up to now. This study includes research about oxygen-18 ( $\delta^{18}\text{O}$ ), deuterium ( $\delta\text{D}$ ) and tritium (T) compositions of different water samples collected from tap, spring and mineral waters in Rize and Trabzon. The obtained results illustrated that activity concentrations of tritium in tap water samples did not exceed limits and recommendations of World Health Organization (WHO), United States Environmental Protection Agency (US EPA), Turkish Standards Institution (TSI) and Turkey Ministry of Health (MOH). The results of isotopic measurements show a little variation. Tritium value decreases from Rize to Trabzon,  $\delta^{18}\text{O}$ ,  $\delta\text{D}$  and d-excess values increase from Rize to Trabzon. It shows Rize waters are younger than Trabzon waters and have shallow circulations. When  $\delta\text{D}$  and  $\delta^{18}\text{O}$  values are examined, it's observed that tap, mineral and spring water samples of Rize and Trabzon are showed tendency to Mediterranean origin precipitations.

*Keywords:*  $\delta^{18}\text{O}$ ;  $\delta\text{D}$ ; Tritium; Rize; Trabzon

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