Mantle-derived fibrous, mono- and polycrystalline diamonds contain noble gases that isotopically are the result of mixing between three sources: the mantle, lithospheric and eventually the primordial one [1]; the crust; and the atmosphere. This last component has been often related to post-eruptive contamination [2]. Yet, the ratios of $^4\text{He}/^iX$ (where $^iX$ is the primordial isotopes $^{20}\text{Ne}$, $^{36}\text{Ar}$, $^{84}\text{Kr}$ and $^{130}\text{Xe}$) are roughly from 50 to 125 times the present-day atmosphere values. During eons these ratios should have not changed dramatically. Primordial noble gas amounts in the atmosphere were fixed during early catastrophic degassing episode(s). Contrarily to the radiogenic $^{40}\text{Ar}^*$, the $^4\text{He}$ – even if abundantly produced in the terrestrial crust – is transient in the atmosphere at equilibrium between crustal production and atmospheric escape. If we assume recent incorporation of air by diffusion – following the classical Graham’s Law – expected enrichments for the $^4\text{He}/^iX$ ratios will be 1-2 order of magnitude lower than the observed ones. However, seawater – possibly re-gassed in the mantle by subduction and partitioned by solubility at disequilibrium with carbonatitic or silicic melts –could explain most enrichment patterns. This hypothesis would imply that the so-called “subduction barrier” is quasi inexistent for all noble gases, even the lighter ones such as $^4\text{He}$, and that mantle feeding diamonds is recording past subduction.
