Based on nitrogen and argon isotope analysis of Chang 'e-5 lunar soil, the volatiles in the landing area may have components of "Earth wind"

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Nitrogen is an important volatile element. There are different arguments on the origin of exogenous nitrogen in lunar soil, and there are relatively few studies on indigenous nitrogen in lunar rocks. Compared with Apollo and Luna samples, Chang 'e 5 samples were sampled from higher latitudes and are much younger basaltic rocks. The nitrogen contents and isotopic compositions of these samples will provide a new basis for clarifying the N isotopic composition of the lunar surface and interior, the effect of the "Earth wind" on the Moon, and understanding the distribution of volatile elements such as nitrogen in the solar system. During space exposure, the interaction of high-energy galactic cosmic rays and low-energy solar flare protons with oxygen in the mineral lattice can produce cosmogenic 15N, which can alter the indigenous N isotopic composition of the Moon. The coupled nitrogen and noble gas signatures can correct for each interfering factor and identify different sources of N in lunar samples. By analyzing nitrogen and argon isotopes, the Chang 'e-5 sample has a distinct atmospheric component that may be influenced by "Earth wind".

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