$^{40}\text{Ar}/^{39}\text{Ar}$ method using cosmogenic $^{39}\text{Ar}$

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Finding of $^{39}\text{Ar}$ of cosmogenic origin in meteorites was one of cues for developing $^{40}\text{Ar}/^{39}\text{Ar}$ method. If the production rate of $^{39}\text{Ar}$ is uniform, and if a long enough period elapses, the production and decay of $^{39}\text{Ar}$ reach to equilibrium since $^{39}\text{Ar}$ has a half life of 293 years. Eventually a rock or a mineral possesses a certain amount of $^{39}\text{Ar}$ depending on its potassium content. Using samples under the same exposure to cosmic ray, and determining an age of a sample, $^{40}\text{Ar}/^{39}\text{Ar}$ method can be applicable to the rest of unknowns. One of such possibilities may be to apply to samples on the lunar surface. No need for atmospheric contamination and $^{36}\text{Ar}$ measurement, and the application may be easier than that on the earth’s surface. However, the method cannot be applied to samples in some depth or with different exposure histories.

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