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Noble gases in the HF-soluble fraction of the CI chondrite Ivuna.

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Noble gases in acid-soluble phases have only been sparsely studied, partly due to experimental difficulties. With our Closed System Step Etching (CSSE) technique bulk meteorite samples are etched in-vacuo, making it possible to directly analyse the acid soluble phases. Primordial solar noble gases have previously been detected in CV and EH chondrite solubles in such studies [1,2]. Here, we analysed all noble gases in the HF-soluble fraction of Ivuna by CSSE in 27 steps. In addition to atmospheric and cosmogenic noble gases, the HF-soluble phases of Ivuna contain: (1) an enrichment of the light Xe isotopes, (2) regolith-derived solar wind, which makes it impossible to detect any primordial solar gases that might be present (c.f. [1,2]) and (3), a primordial Ne component known to be carried by presolar nanodiamonds ("HL"). The presence of this component in the solubles could indicate that it is carried by another phase in addition to diamonds, possibly incorporated either in a stellar environment, or re-trapped during parent body processing.

[1] Busemann, H. et al. (2003), LPSC, abstract 1674.

[2] Christen, F. & Busemann, H. (2004). MetSoc, abstract 5188.

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