

Authors: Herzog G. F., Xue S., Klein J., Juenemann D., Middleton R.**Publ. Type:** Abstract**Category:** Meteorites**Title:** ²⁶Al and ¹⁰Be Activities of Lodranites and Winona.**Year:** 1993 **Volume:** 28 **Number:** 3 **Series:** **Pages:** 362-363**Journal:** Meteoritics **ISSN:** 0026-1114**Remarks:** Paper presented at the 56th Annual Meeting of the Meteoritical Society, Vail, Colorado, July 19-23, 1993.**Language:** English**Record No.:** A0523100**Publisher:** The Meteoritical Society, Allan Press, Inc.**Bib-Code:** 1993Metic..28R.362H**Place:** Lawrence, Kansas**Ref. Source:** ADS Abstract Service.**Title in MetBase Library?:** Yes**Keywords:** ACCELERATOR MASS SPECTROMETRY, ALUMINUM-26, AMS, BE-10, BERYLLIUM-10, COSMIC RAY AGES, COSMOGENIC NUCLIDES, AL-26, RADIONUCLIDES, ALUMINUM ISOTOPES, PRIMITIVE ACHONDRITES, METEORITES, WINONAITES, STONY-IRON METEORITES, LODRANITES, ACTIVITY, STONY METEORITES,**Objects:** LEW 88280
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MAC 88177
Winona
Y-791491**Abstract:** Abstract text by courtesy of Astrophysics Data System (ADS), SAO, Cambridge, MA

Noble gas measurements by [1] indicate that four lodranites LEW 88280, Lodran (a fall), MAC 88177, and Yamato 791491 have the same cosmic ray exposure age of a few million years. The elevated ²²Ne/²¹Ne ratios of these lodranites, from 1.22 to 1.28 [1], suggest that shielding was light and production rates appreciably lower than in average chondrites. Cosmic-ray irradiation in space for, say, 4 My would bring ²⁶Al and ¹⁰Be to within 2% and 16% of their respective saturation values. Thus measurement of ²⁶Al may provide information about production rates and shielding and ¹⁰Be about exposure age. We separated magnetically metal- and silicate-rich material from the four lodranites mentioned above and from Winona. The ²⁶Al and/or ¹⁰Be activities (Table 1) were measured by accelerator mass spectrometry [2] with the statistical 1-sigma precision shown; the activities are thought to have an overall accuracy of 6-8%. Although the metal phases were etched with HF, they retained some silicate. To get a quantitative indication of the amounts of silicate present, the Mg concentrations in aliquots of the dissolved metal samples (Table 1) were measured by ICP/MS. The Mg, Al, Ca, Ti, Mn, and Fe contents of the silicate phases were determined by DCP emission spectrometry [3]. The measured activities in silicates from LEW 88280, Lodran, and Y 791491 resemble one another closely: The average ²⁶Al and ¹⁰Be activities are 50.9 and 16.7 dpm/kg compared to estimated production rates of about 55 and 23 dpm/kg. These results lead to an exposure age of ~3.3 My, but do not indicate substantial lowering of production rates. The ²⁶Al and ¹⁰Be contents of MAC 88177 are about half the values expected at saturation under normal shielding and are lower than those in the other three lodranites. These results are consistent with the very light shielding inferred from the exceptionally high ²²Ne/²¹Ne ratio of 1.28, and perhaps with some lowering due to terrestrial age. Kirsten et al. [4] found a ²¹Ne content of 25.2 x 10⁻⁸ cm³ STP/g and a low ²²Ne/²¹Ne ratio of 1.071 for Winona, a find of uncertain age with heavily weathered metal. The measured ¹⁰Be activities are also low, about half the estimated production rates. A ²¹Ne production rate of about 0.314 x 10⁻⁸ cm³ STP/g- My would be expected under normal shielding in a body with the bulk composition of Winona [5,6]. If we assume a short terrestrial age and a constant ratio of ¹⁰Be to ²¹Ne production [7], then an exposure age on the order of 150 My is implied. Use of the measured ²⁶Al activity in the same way gives a shorter but more uncertain exposure age of ~110 My. The high ²⁶Al activity in Winona "metal" may indicate the presence of sulfide [5]. Table 1, which appears here in the hard copy, shows ¹⁰Be and ²⁶Al (dpm/kg) in silicate- and metal-rich samples from lodranites and Winona. References: [1] Eugster O. and Weigel A. (1993) LPS XXIV, 453- 454. [2] Middleton R. and Klein J. (1986) Proc. Workshop Tech. Accel. Mass Spectrom., England, 76-81; Middleton R. and Klein J. (1987) Phil. Trans. R. Soc. London, A323, 121-143. [3] Feigenson and Carr (1985) Chem. Geol., 51, 19-27. [4] Schultz L. and Kruse H. (1989) Meteoritics, 24, 155-172. [5] Mason B. and Jarosewich E. (1967) GCA, 31, 1097-1099. [6] Eugster O. (1988) GCA, 52, 1649-1659. [7] Graf Th. et al. (1992) GCA, 54, 2521-2534.