

**AL-26, BE-10, AND MN-53 IN MARTIAN METEORITES**

A. A. Berezhnoy<sup>1,2</sup>, T. E. Bunch<sup>3</sup>, P. Ma<sup>1,4</sup>, G. F. Herzog<sup>1</sup>, K. Knie<sup>5,6</sup>, G. Rugel<sup>5</sup>, T. Faestermann<sup>5</sup>, and G. Korschinek<sup>5</sup>.  
<sup>1</sup>Rutgers Univ., Piscataway, NJ 08854, US. <sup>2</sup>Moscow State Univ., Moscow, Russia <a\_tolok@mail.ru>. <sup>3</sup>Northern Arizona University, Flagstaff, AZ 86011. <sup>4</sup>DCLS, 600 North 5th Street, Richmond, VA 23219 <sup>5</sup>TU-München, D-85748, Garching, Germany. <sup>6</sup>GSI, Darmstadt, Germany.

**Introduction:** We calculate preliminary cosmic-ray exposure (CRE) ages for several martian meteorites from <sup>26</sup>Al (T<sub>1/2</sub>=0.7 Ma), <sup>10</sup>Be (T<sub>1/2</sub>=1.37 Ma; use of 1.387±0.012 Ma[1] does not change our conclusions) and <sup>53</sup>Mn (T<sub>1/2</sub>~3.7 Ma) activities. The radionuclides were separated chemically by precipitation and ion exchange and analyzed by accelerator mass spectrometry at PRIMELab (<sup>26</sup>Al and <sup>10</sup>Be) and TU-München (<sup>53</sup>Mn).

**Results and discussion:** <sup>26</sup>Al (dpm/kg), <sup>10</sup>Be (dpm/kg), and <sup>53</sup>Mn (dpm/[kg Fe]) activities were as follows: Dar al Gani (DaG) 476, 49.6±2.2, 7.6±0.2, 85±7; Northwest Africa (NWA) 2046, 38.7±1.5, --, 144±38; NWA 2626, 43.1±2.1, --, 145±17; Sayh al Uhaymir (SaU) 005/8, 41.5±0.9, 7.6±0.1, 82±27; Los Angeles, 77.7±3.7, 16.8±0.5, 251±14; NWA 856, 72.7±3.9, 11.5±0.3, 111±16; NWA 2975, 91.1±5.1, 13.2±1.7, 218±28; NWA 1950, 65.2±2.5, 15.3±0.3, 185±23; NWA 2646, 46.0±2.5, --, 190±27; Nakhla, 75±1.2, 19.9±0.5, 500±50; Yamato 000749 (Y749), 69.9±3.6, 18.7±0.6, 373±49; Yamato 000593 (Y593), 64.6±3.5, 22.3±0.2, 340±111. Fe concentrations were either measured by ICP-MS or taken from the literature. Agreement with published values for <sup>26</sup>Al and <sup>10</sup>Be is generally good. Average <sup>53</sup>Mn activities, like the CRE ages, increase from olivine-phyric to basaltic to lherzolitic shergottites. CRE-ages, *T*, were calculated by minimizing  $SS = \sum_i \left\{ \left( A_i - P_i(R, d) [1 - \exp(-\lambda T)] \right) / A_i \right\}^2$ , where

*A*=measured activity; *P*(*R*,*d*)=production rate due to galactic cosmic rays for various exposure geometries [2] with elemental compositions from the literature. For all stones but NWA 2975, we included published <sup>21</sup>Ne concentrations ( $\lambda_{21} = 0$ ) in the fits. Inclusion of the effects of solar cosmic rays has not yet improved the results. Following are newly calculated and published CRE ages (Ma) neglecting possible adjustments for terrestrial decay. Olivine-phyric shergottites - DaG 476: 0.89, 1.05[3], 1.36[4]; SaU 005/8: 1.3, 1.25[3], 1.3[4]. Basaltic shergottites - Los Angeles: 3.3, 3.00[6]; NWA 856: 1.5, 2.6[7]; NWA 2975: 1.6. Lherzolitic shergottites NWA 1950: 2.7, 2.9-5.3[8,9]. Nakhrites - Nakhla: 9.3, 11[10]; Yamato 000749/593: 10.5, 11.2-12.3[9]. Calculation of the CRE ages of NWA 2046, 2626, and 2646 await new measurements of <sup>10</sup>Be.

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