**68501 and 68510**

Soil and rake residue

906 and 17 grams

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**Figure 1:** Close-up photo of area where 68500 and 68510 were collected. AS16-107-17528.

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**Figure 2:** Map of Apollo 16 site.

**Figure 3:** Map of station 8, Apollo 16.

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**Introduction**

Station 8 was supposed to be on a ray from South Ray Crater, but material from SRC has not been identified as such.
Petrography
The maturity index for 68501 is $I_s/FeO = 85$, with agglutinate content of about 38%. The average grain size is 84 microns, 104 microns or 113 microns (Heiken, von Engelhardt or Butler)(figures 7).

The mode for 68501 is given in Heiken et al. (1973) and Houck (1982).

Smith and Steele (1972) cataloged the rake samples from 68510 and Marvin (1972) cataloged the coarse fine particles.

Chemistry
Bansal et al. (1972), Taylor et al. (1973) and Korotev (1981) determined the chemical composition of 68501 (table 1, figure 4 and 6).

Moore et al. (1973) and des Marais et al. (1973) determined 130 ppm and 82 ppm carbon for 68501 (figure ), respectively. Kerridge et al. (1975) determined 134 ppm carbon and 83 ppm nitrogen.

Cosmogenic isotopes and exposure ages
Eldridge et al. (1973) determined the cosmic-ray-induced activity of $^{26}\text{Al} = 84 \text{ dpm/kg}$ and $^{22}\text{Na} = 38 \text{ dpm/kg}$.

Other Studies
Hintenberger and Weber (1973) determined the rare gas content and isotopic ratios for 68501 as a function of grain size showing surface correlation.

Behrmann et al. (1973) determined the density of fossil nuclear tracks in grains from 68501 (figure 8).
average grain size = 104 microns

**Figure 7a:** Grain size distribution for 68501 (Graf 1993, data by Heiken et al.).

average grain size = 84 microns

**Figure 7b:** Grain size distribution for 68501 (Graf 1993, data by vonEngelhardt).
average grain size = 113 microns

References for 68501.


Eldridge J.S., O’Kelley G.D. and Northcutt K.J. (1973) Radionuclide concentrations in Apollo 16 lunar samples
Table 1. Chemical composition of 68501.

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<th>Reference</th>
<th>Korotev81</th>
<th>Taylor73</th>
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Sc ppm 9.2 (a) 10 (b) 9.6
V 27 (b) 14
Cr 795 (a) 850 (b) 737 (e) 760
Co 34.7 (a) 34 (b) 30
Ni 560 (a) 420 (b) 490
Cu 4.5 (b)
Zn
Ga
Ge ppb
As
Se
Rb 2.3 (b) 2.7 (e) 2.7
Sr 169 (e) 158
Y 49 (b) 48
Zr 220 (b) 185 (e) 194
Nb 14.9 (b)
Mo
Ru
Rh
Pd ppb
Ag ppb
Cd ppb
In ppb
Sn ppb
Sb ppb
Te ppb
Cs ppm 0.09 (b)
Ba 185 (b) 140 (e) 147
La 13.6 (a) 15.7 (b) 12.9 (e) 13.4
Ce 35.5 (a) 41.5 (b) 33.6 (e) 34
Pr 5.54 (b)
Nd 21.6 (b) 20.9 (e)
Sm 6.2 (a) 6.32 (b) 5.96 (e) 6.55
Eu 1.2 (a) 1.29 (b) 1.19 (e) 1.25
Gd 7.57 (b) 7 (e)
Tb 1.28 (a) 1.23 (b) 1.27
Dy 8.35 (b) 7.99 (e)
Ho 1.92 (b)
Er 5.45 (b) 4.71 (e)
Tm 0.75 (b)
Yb 4.4 (a) 4.95 (b) 4.27 (e) 4.65
Lu 0.62 (a) 0.73 (b) 0.621 (e) 0.67
Hf 4.5 (a) 4 (b) 4.5
Ta 0.8 (a)
W ppb
Re ppb
Os ppb
Ir ppb
Pt ppb
Au ppb
Th ppm 2.4 (a) 2.45 (b) 2.28 (c) 2.4
U ppm 0.63 (b) 0.58 (c) 0.6 (e) 0.62

technique: (a) INAA, (b) SSMS, (c) radiation count. (d) XRF, (e) IDMS

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Marvin U.B. (1972) Apollo 16 coarse fines (4-10 mm): Sample classification, description and inventory. JSC Catalog.


Smith J.V. and Steele I.M. (1972) Apollo 16 rake samples 67515 to 68537: Sample classification, description and inventory. Curator’s Catalog. JSC


Tera F. and Wasserburg G.J. (1972b) U-Th-Pb systematics in the lunar highland samples from the Luna 20 and Apollo 16 missions. *Earth Planet. Sci. Lett.* 17, 36-51.