COSMIC DUST CATALOG

Volume 10/Number 1

(Particles from Collection Flag W7074)

Compiled by

Cosmic Dust Preliminary Examination Team (CDPET)*

NASA/Johnson Space Center
Houston, Texas 77058 U.S.A.

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1. INTRODUCTION

Since May, 1981, the National Aeronautics and Space Administration (NASA) has used aircraft to collect cosmic dust (CD) particles from Earth's stratosphere. Specially designed dust collectors are prepared for flight and processed after flight in an ultraclean (Class 100) laboratory constructed for this purpose at the Lyndon B. Johnson Space Center (JSC) in Houston, Texas. Particles are individually retrieved from the collectors, examined and cataloged, and then made available to the scientific community for research. Cosmic dust thereby joins lunar samples and meteorites as an additional source of extraterrestrial materials for scientific study.

This catalog summarizes preliminary observations on 147 particles retrieved from collection surface W7074. This surface was a flat plate "flag" (with a 30 cm$^2$ surface area) which was coated with silicone oil and then flown aboard a NASA WB-57 aircraft during a series of flights that were made within North America during 1988. This flag was installed in a specially constructed wing pylon which ensured that the necessary level of cleanliness was maintained between periods of active sampling. During successive periods of high altitude (20 km) cruise, the flag was exposed in the stratosphere by pilot command and then retracted into sealed storage containers prior to descent. In this manner, a total of 32 hours of stratospheric exposure was accumulated for flag W7074.
2. PROCESSING OF PARTICLES

Particle mounts designed for the JEOL 100CX scanning transmission electron microscope (STEM) are currently the standard receptacles for CD particles in the JSC laboratory. Each mount consists of a graphite frame (size ~3x6x24 mm) onto which a Nucleopore filter (0.4 μm pore size) is attached. A conductive coat of carbon is vacuum evaporated onto the mount and then a microscopic reference pattern is "stenciled" onto the carbon-coated filter by vacuum evaporation of aluminum through an appropriately sized template. CD particles are individually removed from collection flags using glass needle micromanipulators under a binocular stereomicroscope. Each particle is positioned on an aluminum-free area of a Freon-cleaned, carbon-coated filter and washed in place with hexane to remove silicone oil. Each mount is normally limited to 16 particles. All processing and storage of each particle is performed in a Class 100 clean room.
3. PRELIMINARY EXAMINATION OF PARTICLES

Each rinsed particle is examined, before leaving the Class 100 clean room processing area, with a petrographic research microscope equipped with transmitted, reflected and oblique light illuminators. At a magnification of 500X, size, shape, transparency, color, and luster are determined and recorded for each particle.

After optical description, each mount (with uncoated particles) is examined by scanning electron microscopy (SEM) and X-ray energy dispersive spectrometry (EDS). Secondary-electron imaging of each particle is performed with a JEOL 100CX STEM operated in the SEM mode and at an accelerating voltage of 40 kV. Images are therefore of relatively low contrast and resolution due to deliberate avoidance of conventionally applied conductive coats (carbon or gold-palladium) which might interfere with later elemental analyses of particles. EDS data are collected with a JEOL-35CF SEM equipped with a Si(Li) detector and PGT 4000T analyzer. Using an accelerating voltage of 20 kV, each particle is raster scanned and its X-ray spectrum recorded over the 0-10 keV range by counting for 100 sec. No system (artifact) peaks of significance appear in the spectra.

It should be pointed out that the SEM/EDS procedure used in preparing this catalog is different than that used in preparing Cosmic Dust Catalogs, Volumes 1-3 and 8. In these catalogs, EDS analysis was performed using the JEOL 100CX STEM operated at 40 kV. Only the EDS spectra exhibit differences that are likely to be noticed. These differences are a slightly higher background and more efficient excitation of high atomic number elements for EDS spectra collected at 40 kV relative to those collected at 20 kV. However, each catalog includes spectra of the same selected comparison standards, which allows comparison of spectra from one catalog to the next to be made. Please refer to Section 5 for a more complete discussion.

Following SEM/EDS examination, each particle mount is stored in a dry nitrogen gas atmosphere in a sealed cabinet.
4. CATALOG FORMAT

Each page in the main body of the catalog is devoted to one particle and consists of an SEM image, an EDS spectrum, and a brief summary of preliminary examination data obtained by optical microscopy. The unique identification number assigned to the particle appears at the top of the page. Sources of the descriptive data are as follows:

**SIZE** (μm) is measured using the original SEM image and its known magnification factor. For an irregularly shaped particle, the minimum dimension in the plane of the field of view is located and determined; then a second (maximum) dimension is measured at a right angle to the first. For a spherical or equidimensional particle, only a single size is recorded.

**SHAPE** is generalized to be spherical (S) or irregular (I). Particles having shapes intermediate between S and I are not uncommon and may be denoted as S/I.

**TRANSPARENCY** (abbreviated TRANS.) is determined by optical microscopy to be transparent (T), translucent (TL), or opaque (O). Significant variations in transparency within a particle are annotated on the SEM image.

**COLOR** is determined by optical microscopy using oblique (fiber optic, quartz halogen) illumination supplemented with normal reflected (tungsten lamp) illumination. The distinction of dark (Dk.) from light (Lt.) particles is unambiguous, although the distinction of colorless (CL) from pale-colored conditions is sometimes problematical. Complex colorations of individual particles may be noted in the "COMMENTS" column and annotated on the SEM image.

**LUSTER** is determined by optical microscopy using reflected normal (tungsten lamp) illumination and supplemented with oblique (fiber optic, quartz halogen) illumination. Commonly applied descriptions, adopted from mineralogical usage, include dull (D), metallic (M), submetallic (SM), subvitreous (SV), vitreous (V), and resinous (R). Lusters transitional between categories or difficult to identify are indicated accordingly (D/SM, SV/V, etc.).

**TYPE** indicates a provisional first order identification of each particle based on its morphology (from SEM image), elemental composition (from EDS spectrum), and optical properties. We emphasize that, for catalog purposes, types are defined for their descriptive and curatorial utility, not as scientific classifications. These tentative categorizations, which reflect judgments based on the collective experience of the CDPET, should not be construed to be firm identifications and should not dissuade any investigator from requesting any given particle for detailed study and more complete identification. In the absence of any generally accepted taxonomy for stratospheric dust, the precise identification of each particle in our inventory is beyond the scope and intent of our collection and curation program. Indeed, the reliable identification and scientific classification of cosmic dust is one of many important research tasks that we hope this catalog will stimulate. We indicate particle "TYPE" only to aid the users of this catalog (especially those new to small-particle analysis) in distinguishing possible cosmic dust
particles from other particles which are invariably collected during stratospheric dust sampling. In this catalog, particles are organized according to their type. Categories used in this catalog are defined as follows:

C: Cosmic dust (variety unspecified) or other extraterrestrial material. In the strict sense, "cosmic dust" refers only to those particles which have not been modified during passage from interplanetary space to Earth's stratosphere. In this catalog, though, particle type "C" is used to conveniently group together all particles which are judged to be of extraterrestrial origin, including those that have apparently experienced strong ablational heating or melting. Type "C" particles are provisionally identified as those having one of the three following sets of attributes:

(a) irregular to spherical, opaque, dark-colored particles composed mostly of Fe with minor Ni or S.
(b) irregular to spherical, translucent to opaque, dark-colored particles containing various proportions of Mg, Si, and Fe with traces of Al, Ca, S, or Ni.
(c) irregular to faceted or blocky, transparent to translucent particles containing mostly Mg, Si, and Fe but with traces of Al or Ca, S, or Ni.

Category (a) and (b) particles commonly display either complex, porous aggregate type morphologies or distinctively spherical shapes and dull to metallic lusters which distinguish them from terrestrial minerals. Their EDS spectra are reminiscent of those exhibited by meteoritic Fe Ni or FeS minerals, or combinations of Fe Ni S phases with olivine and/or pyroxene. Category (c) particles display morphologies and EDS spectra which suggest that they are fragments of olivine or pyroxene crystals, neither of which are significant components of stratospheric volcanic ash. Particles which do not fall easily into categories (a), (b), or (c) but which possess some of the same attributes may be classified here as "C?".

TCA: Terrestrial contamination (artificial or man-made). Particles included in the "TCA" category are commonly irregular in shape (though a few may be spherical) and may be transparent, translucent, or opaque. Their EDS spectra commonly show Al, Fe, or Si as the principal peaks but with a variety of minor peaks including those of Ti, V, Cr, Mn, Ni, Cu, or Zn and at abundances which are frequently much greater than those expected in common minerals. However, such compositions are similar to those
expected for certain metal alloys. In some cases, a high intensity (relative to intensities of characteristic X-ray peaks) of continuum radiation occurs in the EDS spectrum, suggesting that low atomic number elements not detectable by the EDS (e.g., H, C, N, O) are abundant in the particle. Such "TCA" particles are tacitly inferred to by synthetic carbon-based materials. (This category probably includes particles produced by or derived from aircraft operation or collector hardware, or possibly spacecraft debris. However, some of these particles are worthy of additional research and may represent true extraterrestrial "low Z" material.)

TCN: Terrestrial contamination (natural). "TCN" particles may be transparent to opaque and may exhibit a variety of colors. However, they are commonly irregular in shape and distinctively rich in Si and Al with minor abundances of Na, K, Ca, or Fe. Morphologies and EDS spectra of most "TCN" particles compare favorably with respective properties of silica polymorphs, feldspar, or silicic volcanic glass, three materials which are principal components of stratospheric volcanic ash. In addition, platy or porous aggregate type particles of light color and Si, Al-rich composition may be silicic clay minerals, common phases in Earth's surface soils. Irregular, reddish Fe-rich particles may also be products of terrestrial rock weathering. Recognition of these and other phases as "TCN" particles is based mostly on CDPET's collective mineralogical experience and comparison with reference samples. Less commonly, the "TCN" category may include distinctive particles with apparently non-random shapes which are rich in low atomic number elements (as inferred from their EDS spectra having high levels of continuum X-radiation and relatively small peaks for characteristic X-rays). Those rare particles are distinguished from "TCA" particles by their unusual, organized morphologies and probably represent biological contaminants.

AOS: Aluminum oxide sphere. An "AOS" is transparent, subvitreous to vitreous in luster, colorless to pale yellow and at least approximately spherical. However, shape may range from nearly perfect sphericity to pronounced ellipticity, and surface texture may range from very smooth to rough. Other spheres or irregularly shaped material may be attached to its surface. Al is the distinctively dominant (or only) peak in its EDS spectrum. A sphere displaying the attributes of an "AOS" except with major elements in addition to Al may be listed as "AOS?" or "?". Transparent Al-rich particles of
irregular shape would probably be listed as "TCA?". ("AOS" particles are products of solid fuel rocket exhausts.)

Again, this system for provisional classification of particles is presented only as a first-order attempt to distinguish particles which are probably extraterrestrial in origin from those which are probably contaminants. All particles will require careful research examination before they can be satisfactorily identified.

COMMENTS are included for particles with special features or histories. Particles lost during or after preliminary SEM examination or particles with possible genetic relationships to other particles are noted here.
5. ANALYSES OF REFERENCE MATERIALS

The usefulness of the SEM images and EDS spectra provided for particles in this catalog is enhanced by comparison with similar data products obtained for mineral standards of known composition. Accordingly, a typical EDS spectrum is presented for each of three standard minerals prepared as polished grain mounts (San Carlos olivine, USNM 111312/444; diopside JLC 99 63; Kakanui hornblende, USNM 143965; Allende Meteorite Bulk Powder, NMNH 3529). Analyses of these optically flat surfaces eliminate inter-sample geometrical variations so that effects of detection limits and compositional variations, in general, on relative peak heights in the raw spectra can be more readily assessed. Even so, the polished grain spectra should not be over-interpreted because no corrections have been attempted for atomic number, absorption, or fluorescence effects. The spectra are presented simply as additional aids to the meaningful use of the sample particle EDS spectra. Investigators who might wish to compare performance characteristics of their EDS analytical systems with those of the system used by CDPET in preparing these catalog data should contact Curator/Cosmic Dust at the address given in Section 6. A short-term loan of a polished grain mineral standard can then be arranged.

As pointed out in Section 3, the EDS spectra included in this catalog were obtained using a primary electron energy of 20 kV, whereas spectra in Catalogs 1-3 and 8 were obtained with a different instrument operated at 40 kV. Although the effects on EDS spectra to be expected from such a change are well known from X-ray spectrometric analysis, they are worth pointing out to avoid confusion among the readers of this catalog. The major effects of concern to Cosmic Dust Catalog users can be seen by comparing the two "Allende (C3) Meteorite Bulk Powder" spectra, one of which was obtained at 20 kV and the other at 40 kV, as presented in Cosmic Dust Catalogs 1-3 and 8 (only spectra collected at 20 kV are presented in this catalog). In the 20 kV spectrum, the Si peak is more intense than the principal peak of Fe, whereas the opposite is true for the 40 kV spectrum. In general, the 20 kV spectra in this catalog will show peaks of light elements enhanced relative to peaks of heavy elements when compared with 40 kV spectra published in Catalogs 1-3 and 8. The explanation is based both on geometrical differences between X-ray paths in the two EDS systems (the JEOL 35CF system is actually more favorable for light element analysis) and on electron and X-ray physics (X-ray emission by heavy elements is more intense at 40 kV than at 20 kV). Thus, readers are cautioned against attempting to quantitatively intercompare 40 kV spectra with 20 kV spectra. Still, the spectra in each catalog should continue to serve as originally intended. Namely, the sample and standard spectra in any given catalog will represent a self-consistent data set.
MO—
SRN CRR LOS
OLIVINE
(USNM 111312/4441)

SAN CARLOS
OLIVINE
(USNM 111312/4441)

WEIGHT %

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xi
DIOPSIDE
JLC 99-63

WEIGHT %

SiO₂  TiO₂  Al₂O₃  Cr₂O₃  Fe₂O₃  FeO  NiO  MnO  MgO  CaO  Na₂O  K₂O  H₂O  TOTAL

51.93  0.46  6.31  0.96  1.80  2.34  0.04  0.07  16.05  18.64  1.39  -  -  99.99
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**Kakanui Hornblende**

(USNM 143965)
ALLENDE (C3) METEORITE
BULK POWDER
(NMNH 3529)
20 KV

WEIGHT %

\[
\begin{array}{ccccccccccccc}
\text{SiO}_2 & \text{TiO}_2 & \text{Al}_2\text{O}_3 & \text{Cr}_2\text{O}_3 & \text{FeO} & \text{MnO} & \text{MgO} & \text{CaO} & \text{Na}_2\text{O} & \text{K}_2\text{O} & \text{P}_2\text{O}_5 & \text{C} \\
34.23 & 0.15 & 3.27 & 0.52 & 27.15 & 0.18 & 24.62 & 2.61 & 0.45 & 0.03 & 0.23 & 0.29 \\
\end{array}
\]

\[
\begin{array}{ccccccccccccc}
\text{FeS} & \text{NiS} & \text{CoS} & \text{Fe}^\circ & \text{Ni}^\circ & \text{Co}^\circ & \text{TOTAL} \\
4.03 & 1.60 & 0.08 & 0.17 & 0.36 & 0.01 & 99.98 \\
\end{array}
\]
6. SAMPLE REQUESTS

Scientists desiring to perform detailed research on particles described in this catalog should apply in writing to:

Curator/Cosmic Dust
Code SN2
NASA/Johnson Space Center
Houston, Texas 77058
U.S.A.

Telephone: (713) 483-5128
FTS: 525-5128

Sample requests should refer to specific particle identification numbers and should describe the research being proposed as well as the qualifications and facilities of the investigator making the request. Additionally, requests for particles not yet passed through preliminary examination will be considered if the requester can demonstrate a strong need for them. NASA will arrange for a review of the scientific merits of each request and will inform the requester of the results. Approval of a sample request does not imply or include funding for the proposed research. Questions about NASA funding should be directed to:

Dr. Donald D. Bogard
Discipline Scientist
Planetary Materials and Geochemistry Program
Code SN2
NASA/Johnson Space Center
Houston, TX 77058

Although foreign scientists are welcome to request samples, NASA cannot provide funds to be spent outside the U.S.A. by citizens of other countries.
7. ACKNOWLEDGEMENTS

WB-57 support personnel at Ellington Field performed the loading and unloading of the cosmic dust collectors on the WB-57 aircraft and provided flight log data.

Eugene Jarosewich (Smithsonian Institute, Washington, D.C.) kindly provided mineral standards and the Allende chondrite powder.
8. PARTICLE TABLE OF CONTENTS

Since particles are arranged in this catalog by type, rather than sequentially by mount and number as in previous catalogs, we include a sequential listing of particles and the page on which they may be found, for the user's reading pleasure.

<table>
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<td>35</td>
<td>E8</td>
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<td>G8</td>
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<td>E10</td>
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<td>H9</td>
<td>71</td>
<td>I1</td>
<td>76</td>
<td>I9</td>
<td>78</td>
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<td>I2</td>
<td>144</td>
<td>I11</td>
<td>79</td>
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<td>140</td>
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<td>145</td>
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<td>69</td>
<td>H13</td>
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<td>I6</td>
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<tr>
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<td>I7</td>
<td>147</td>
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<td>143</td>
<td>I8</td>
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{xviii}
COSMIC DUST
SIZE: 21x10
SHAPE: I
TRANS.: O
COLOR: Yellow to black
LUSTER: D/SV
TYPE: C
COMMENTS:
W7074 B 13

SIZE:  15
SHAPE:  I
TRANS.:  TL/O
COLOR:  Colorless to black
LUSTER:  D/V
TYPE:  C
COMMENTS:

S-88-53278
W7074 B 14

SIZE: 28x16
SHAPE: I
TRANS.: TL/O
COLOR: White to black
LUSTER: R/D
TYPE: C
COMMENTS:

NASA JSC
COSMIC DUST PROGRAM
W7074B
W7074 C 2

SIZE: 7
SHAPE: 1
TRANS.: 0
COLOR: Black
LUSTER: D
TYPE: C
COMMENTS:

S-88-53291

W7C2

COUNTS

ENERGY (KEV)

NASA JSC
COSMIC DUST PROGRAM
W7074C
**W7074 C 3**

**SIZE:** 8x7  
**SHAPE:** I  
**TRANS.:** O  
**COLOR:** Black  
**LUSTER:** D  
**TYPE:** C  
**COMMENTS:**

---

**W7C3**

**COUNTS**

**ENERGY (KEV)**

**NASA JSC**  
**COSMIC DUST PROGRAM**  
**W7074C**
W7074 C 4

SIZE: 10x8
SHAPE: I
TRANS.: O
COLOR: Yellow to brown
LUSTER: SM
TYPE: C
COMMENTS:

S-88-53293
W7074 C 6

SIZE: 8x7
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: SM/D
TYPE: C
COMMENTS:

NASA JSC
COSMIC DUST PROGRAM
W7074C
W7074 C 12

SIZE: 6x5
SHAPE: I
TRANS.: O
COLOR: Brown
LUSTER: D
TYPE: C
COMMENTS:

NASA JSC
COSMIC DUST PROGRAM
W7074C
W7074 C 15

SIZE:  15x13
SHAPE:  I
TRANS.:  TL/O
COLOR:  Yellow to black
LUSTER:  R/D
TYPE:  C
COMMENTS:

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074C
W7074 C 22

SIZE: 4
SHAPE: I
TRANS.: TL
COLOR: Black
LUSTER: V
TYPE: C
COMMENTS:

S-88-53309

NASA JSC
COSMIC DUST PROGRAM
W7074C

ENERGY (KEV)
COUNTS

0.0
10.0

SI
MG
AL
CA
S
FE
NI
W7074 C 23

SIZE: 6
SHAPE: S
TRANS.: T
COLOR: Brown
LUSTER: V
TYPE: C
COMMENTS:

S-88-53310

W7C23

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074C

ENERGY (KEV)

0.0 10.0
W7074 D 9

SIZE: 6
SHAPE: I
TRANS.: 0
COLOR: Brown to black
LUSTER: SM/D
TYPE: C

COMMENTS:
Related to W7074D10 and D11
W7074 D 10

SIZE: 9x8
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: SM/D
TYPE: C

COMMENTS:
Related to W7074D9 and D11

COUNTS
W7074 D 11

SIZE: 6
SHAPE: I
TRANS.: 0
COLOR: Brown to black
LUSTER: SM/D
TYPE: C?

COMMENTS:
May be related to W7074D9 and D10
**W7074 D 13**

**SIZE:** 17x15  
**SHAPE:** I  
**TRANS.:** TL/O  
**COLOR:** Brown to black  
**LUSTER:** SM/D  
**TYPE:** C  
**COMMENTS:**

![Image of W7074 D 13 with labeling and analysis graph]
W7074 E 12

SIZE: 11
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: C
COMMENTS:
W7074 F 6

SIZE: 12
SHAPE: I
TRANS.: TL/O
COLOR: Colorless to black
LUSTER: R/D
TYPE: C
COMMENTS:
Largest particle in a field of particles
W7074 H 2

SIZE: 6
SHAPE: I
TRANS.: 0
COLOR: Brown to black
LUSTER: SM
TYPE: C?
COMMENTS:

S-88-53371

NASA JSC
COSMIC DUST PROGRAM
W7074 H 2

ENERGY (KEV)

COUNTS

S
I

Mg

Al

Ca

Fe

Ni

0.0
10.0
SIZE: 20x14
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: SM/D
TYPE: C
COMMENTS:
SIZE: 6
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SM/D
TYPE: C
COMMENTS:
TERRESTRIAL CONTAMINATION (ARTIFICIAL)
W7074 A 1

SIZE: 70x35
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCA

COMMENTS:
Field of particles
W7074 A 2

SIZE: 60x10
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCA

COMMENTS:
Field of particles
W7074 A 5

SIZE: 20x10
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: SV/R
TYPE: TCA
COMMENTS:

COUNTS

ENERGY (KEV)

NASA JSC
COSMIC DUST PROGRAM
W7074A

28
W7074 A 10

SIZE: 11x10
SHAPE: I
TRANS.: O
COLOR: Yellow to brown
LUSTER: SM
TYPE: TCA
COMMENTS:

S-88-53255

15000

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7874A

ENERGY (KEV)
SIZE: 18x8
SHAPE: I
TRANS.: TL/O
COLOR: Yellow to brown
LUSTER: D/SM
TYPE: TCA
COMMENTS:
W7074 B 8

SIZE: 14x13
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA
COMMENTS:

S-88-53275

NASA JSC
COSMIC DUST PROGRAM
W7074B
SIZE: 20x12
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA
COMMENTS:
W7074 B 17

SIZE: 11x7
SHAPE: I
TRANS.: O
COLOR: Brown
LUSTER: D
TYPE: TCA
COMMENTS:

COUNTS

ENERGY (KEV)

NASA JSC
COSMIC DUST PROGRAM
W7074B
W7074 B 18

SIZE:  5
SHAPE:  I
TRANS.:  O
COLOR:  Brown
LUSTER:  SM/D
TYPE:  TCA

COMMENTS:

S-88-53283

W7074 B 18

COUNTS

LOW Z

NASA JSC
COSMIC DUST PROGRAM
W7074B

ENERGY (KEV)
W7074 C 10

SIZE: 14
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R/SV
TYPE: TCA
COMMENTS:

S-88-53297

NASA JSC
COSMIC DUST PROGRAM
W7074C

COUNTS

EN_0.0 10.0

SI  TI
AL  S  CA  K  FE
W7074 C 13

SIZE: 18X12
SHAPE: I
TRANS.: 0
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCA
COMMENTS:

S-88-53300

W7C13

COUNTS

ENERGY (KEV)

NASA JSC
COSMIC DUST PROGRAM
W7074C

36
W7074 C 14

SIZE: 11x10
SHAPE: I
TRANS.: O
COLOR: Yellow to brown
LUSTER: SM/D
TYPE: TCA

COMMENTS:
W7074 C 17

SIZE: 14x13
SHAPE: I
TRANS.: O
COLOR: Yellow to brown
LUSTER: SM/SV
TYPE: TCA
COMMENTS:

ENERGY (KEV) 10.0 0.0 38
COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074C
W7074 D 3

SIZE: 80x25
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA
COMMENTS:

S-88-53313

W703

NASA JSC
COSMIC DUST PROGRAM
W7074D

COUNTS

ENERGY (KEV)

2.0 10.0

40
W7074 D 5

SIZE: 50x30
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA

COMMENTS:
W7074 D 8

SIZE: 6
SHAPE: I
TRANS.: 0
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCA
COMMENTS:
W7074 D 12

SIZE: 12x10
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCA
COMMENTS:

S-88-53320

NASA JSC
COSMIC DUST PROGRAM
W7074D

COUNTS

0.0 10.0 ENERGY (KEV)
W7074 E 1

SIZE: 13
SHAPE: I
TRANS.: TL/O
COLOR: Orange
LUSTER: R
TYPE: TCA
COMMENTS:

COUNTS
0.0 ENERGY (KEV) 10.0

NASA JSC
COSMIC DUST PROGRAM
W7074E
W7074 E 4

SIZE: 32
SHAPE: I
TRANS.: T
COLOR: Yellow to orange
LUSTER: V/R
TYPE: TCA
COMMENTS:

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074E

ENERGY (KEV)
SIZE: 22
SHAPE: I
TRANS.: TL/O
COLOR: Yellow
LUSTER: R
TYPE: TCA
COMMENTS:
W7074 E 9

SIZE: 35x20
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA
COMMENTS:

COUNTS

ENERGY (KEV)

AL
SI
P
CA
FE
W7074 F 5

SIZE: 20
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA
COMMENTS:

COUNTS

ENERGY (KEV)
W7074 F 11

SIZE: 12
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: SM/M
TYPE: TCA
COMMENTS:
Largest particle in a field of particles
W7074 F 12

SIZE: 60x40
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA

COMMENTS:
Largest particle in a field of particles

S-88-53348

ENERGY (KEV) 10.0
0.0

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074 F

5000

SI

MG

S

TI

A

CR

0.0 10.0
SIZE: 11
SHAPE: I
TRANS.: TL/O
COLOR: Colorless to black
LUSTER: SV/D
TYPE: TCA
COMMENTS:
W7074 F 15

SIZE: 30x28
SHAPE: I
TRANS.: TL
COLOR: White to yellow
LUSTER: R
TYPE: TCA
COMMENTS:

W7F15

NASA JSC
COSMIC DUST PROGRAM
W7074F

10000
COUNTS

0.0 10.0
ENERGY (KEV)
W7074 F 16

SIZE: 30x15
SHAPE: I
TRANS.: TL/O
COLOR: Orange to black
LUSTER: R/D
TYPE: TCA

COMMENTS:
W7074 F 17

SIZE: 11x9
SHAPE: I
TRANS.: TL/O
COLOR: Colorless to black
LUSTER: SV/D
TYPE: TCA
COMMENTS:

NASA JSC
COSMIC DUST PROGRAM
W7074F

COUNTS

ENERGY (KEV)

0.0 10.0

55
W7074 G 1

SIZE: 15
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA

COMMENTS:
Related to W7074G2
W7074 G 2

SIZE: 17
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA

COMMENTS:
Related to W7074G1

NASA JSC
COSMIC DUST PROGRAM
W7074G
W7074 G 5

SIZE: 15
SHAPE: S?
TRANS.: TL
COLOR: Yellow
LUSTER: SV
TYPE: TCA

COMMENTS:

S-88-53357

W765

 counts

0.0 10.0
ENERGY (KEV)

NASA JSC
COSMIC DUST PROGRAM
W7074G
W7074 G 8

SIZE: 12x6
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCA

COMMENTS:
Related to W7074G9
W7074 G 9

SIZE: 10
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCA
COMMENTS:
Related to W7074G8

S-88-53361

W7G9

2000

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074G

ENERGY (KEV)

AL

SI

S

TI

FE

0.0

10.0

60
W7074 G 12

SIZE: 25x10
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCA
COMMENTS:

S-88-53363

W7074 G 12

8000

NASA JSC
COSMIC DUST PROGRAM
W7074G
W7074 G 13

SIZE: 16x12
SHAPE: I
TRANS.: TL
COLOR: Orange to brown
LUSTER: R
TYPE: TCA
COMMENTS:

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074G
W7074 G 14

SIZE: 14x11
SHAPE: I
TRANS.: 0
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCA

COMMENTS:

8000

COUNTS

ENERGY (KEV)

AL

CI

FE

NASA JSC
COSMIC DUST PROGRAM
W7074G

63
W7074 G 15

SIZE: 11x9
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCA
COMMENTS:

S-88-53366

W7615

COUNTS

ENERGY (KEV)
W7074 G 16

SIZE:  11x9
SHAPE:  I
TRANS.:  TL
COLOR:  Yellow
LUSTER:  R
TYPE:  TCA
COMMENTS:
W7074 G 19

SIZE: 54x30
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCA
COMMENTS:

NASA JSC
COSMIC DUST PROGRAM
W7074G
W7074 H 5

SIZE: 17
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA
COMMENTS:

S-88-53374

NASA JSC
COSMIC DUST PROGRAM
W7074 H

COUNTS

ENERGY (KEV)
SIZE: 15x11
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA
COMMENTS:
W7074 H 8

SIZE: 9x8
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCA

COMMENTS:
May be related to W7074H9
W7074 H 9

SIZE: 11x6
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCA
COMMENTS: May be related to W7074H8
W7074 H 10

SIZE: 51x30
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA
COMMENTS:

COUNTS

ENERGY (KEV)

NASA JSC
COSMIC DUST PROGRAM
W7074H
W7074 H11

SIZE: 17x15
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA
COMMENTS:
W7074 H 12

SIZE: 5
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA
COMMENTS:

S-88-53381

W7112

1500

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074H

0.0
ENERGY (KEV)
10.0

74
SIZE: 30x18
SHAPE: I
TRANS.: T/TL
COLOR: Orange
LUSTER: V/R
TYPE: TCA
COMMENTS:
SIZE: 12x10
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCA

COMMENTS:
Largest particle in a field of particles
SIZE: 13
SHAPE: S
TRANS.: T/TL
COLOR: Orange
LUSTER: SV/R
TYPE: TCA
COMMENTS:
SIZE: 9x6
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCA
COMMENTS:
W7074 I 13

SIZE: 18x8
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: SM/M
TYPE: TCA

COMMENTS:

S-88-53395
SIZE: 18x11
SHAPE: I
TRANS.: TL
COLOR: Orange
LUSTER: R
TYPE: TCA

COMMENTS:
Largest particle in a field of particles
TERRESTRIAL CONTAMINATION (NATURAL)
SIZE: 13x8
SHAPE: I
TRANS.: TL/O
COLOR: Yellow to black
LUSTER: D/SV
TYPE: TCN
COMMENTS:
W7074 A 9

SIZE: 12x8
SHAPE: I
TRANS.: TL/O
COLOR: Yellow to black
LUSTER: R
TYPE: TCN
COMMENTS:

S-88-53254

COUNTS

1000

W7A9

COSMIC DUST PROGRAM
W7074A

NASA JSC

COSM.

FE

Si

CA

AL

S

11

Ti

FE
W7074 A 11

SIZE: 20x11
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: D
TYPE: TCN
COMMENTS:

S-88-53256

1117011

COUNTS 1.000

ENERGY (KEV) 12.0

15000

NASA JSC
COSMIC DUST PROGRAM
W7074A
W7074 A 15

SIZE: 14x10
SHAPE: I
TRANS.: TL/O
COLOR: Colorless to black
LUSTER: SV/D
TYPE: TCN
COMMENTS:

S-88-53259

NASA JSC
COSMIC DUST PROGRAM
W7074A

ENERGY (KEV)
COUNTS
20000
0.0
10.0
W7074 A 16

SIZE: 11x5
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCN
COMMENTS:

S-88-53260

COUNTS

ENERGY (KEV)
W7074 A 18

SIZE: 6
SHAPE: I
TRANS.: TL/O
COLOR: Colorless to black
LUSTER: SV/D
TYPE: TCN
COMMENTS: May be related to W7074A27

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074A
W7074 A 20

SIZE: 29x11
SHAPE: I
TRANS.: TL/O
COLOR: Colorless to black
LUSTER: SV/D
TYPE: TCN
COMMENTS:

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074A
W7074 A 21

SIZE: 15x12
SHAPE: I
TRANS.: TL/O
COLOR: Yellow to black
LUSTER: R/D
TYPE: TCN
COMMENTS:

S-88-53263

NASA JSC
COSMIC DUST PROGRAM
W7074A

COUNTS

ENERGY (KEV)
W7074 A 22

SIZE: 11x9
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCN

COMMENTS:
Largest particle in the field of particles. May be related to W7074A23
W7074 A 23

SIZE: 6
SHAPE: I
TRANS.: 0
COLOR: Brown to black
LUSTER: SM
TYPE: TCN
COMMENTS:
May be related to W7074A22
W7074 A 24

SIZE: 6
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCN
COMMENTS:
SIZE: 7
SHAPE: I
TRANS.: 0
COLOR: Black
LUSTER: D
TYPE: TCN
COMMENTS:

S-88-53267

W7R25

8000

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074A

ENERGY (KEV)

0.0  10.0

96
W7074 A 27

SIZE: 4
SHAPE: I
TRANS.: TL/O
COLOR: Colorless to black
LUSTER: SV/D
TYPE: TCN
COMMENTS:

S-88-53268
W7074 B 1

SIZE: 14x7
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SV/D
TYPE: TCN

COMMENTS:

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074 B

ENERGY (KEV)

0.0

10.0
SIZE: 12x8
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: D
TYPE: TCN
COMMENTS:
W7074 B 3

SIZE: 25x11
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SV/D
TYPE: TCN

COMMENTS:
May be related to W7074B4
W7074 B 4

SIZE: 12x11
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: D
TYPE: TCN

COMMENTS:
May be related to W7074B3
W7074 B 6

SIZE: 27x19
SHAPE: I
TRANS.: TL
COLOR: Yellow to orange
LUSTER: R
TYPE: TCN
COMMENTS:

COUNTS

ENERGY (KEV)

0.0 10.0

S  K  FE

AL  SI
W7074 B 7

SIZE: 19
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCN
COMMENTS:

S-88-53274

NASA JSC
COSMIC DUST PROGRAM
W7074B
W7074 B 12

SIZE: 28x22
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: R/M
TYPE: TCN
COMMENTS:
W7074 B 15

SIZE: 28x15
SHAPE: I
TRANS.: TL
COLOR: Yellow to red
LUSTER: R
TYPE: TCN
COMMENTS:

S-88-53280

W7B15

8000

COUNTS

SI  CA

AL  S  FE

0.0  10.0

ENERGY (KEV)

NASA JSC
COSMIC DUST PROGRAM
W7074B

105
W7074 B 16

SIZE: 16
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SV/D
TYPE: TCN
COMMENTS:

W7B16

NASA JSC
COSMIC DUST PROGRAM
W7074B
W7074 B 19

SIZE: 8x7
SHAPE: I
TRANS.: O
COLOR: Brown
LUSTER: SM
TYPE: TCN
COMMENTS:

COUNTS

EN_ERGY (KEV)
W7074 B 22

SIZE: 20x16
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: R/D
TYPE: TCN
COMMENTS:
W7074 B 23

SIZE: 10
SHAPE: I
TRANS.: TL
COLOR: Orange
LUSTER: R
TYPE: TCN
COMMENTS:

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074B

ENERGY (KEV)
SIZE: 20x16
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: D
TYPE: TCN
COMMENTS:
W7074 C 1

SIZE: 30x18
SHAPE: I
TRANS.: TL/O
COLOR: Yellow to black
LUSTER: R/M
TYPE: TCN
COMMENTS:
W7074 C 5

SIZE: 50x45
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCN
COMMENTS:

S-88-53294

NASA JSC
COSMIC DUST PROGRAM
W7074C

COUNTS

ENERGY (KEV)

0.0 10.0

114
W7074 C 11

SIZE: 6
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R/SV
TYPE: TCN

COMMENTS:

S-88-53298

4000 COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074C
W7074 C 16

SIZE: 20
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R/D
TYPE: TCN
COMMENTS:

S-88-53303

NASA JSC
COSMIC DUST PROGRAM
W7074C
SIZE: 6
SHAPE: I
TRANS.: 0
COLOR: Black
LUSTER: R/D
TYPE: TCN
COMMENTS:

S-88-53312

W7074 D 2

COUNTS

ENERGY (KEV)

0.0 10.0
SIZE: 15
SHAPE: I
TRANS.: TL/O
COLOR: Yellow to black
LUSTER: R/D
TYPE: TCN
COMMENTS:
SIZE: 20x7
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCN
COMMENTS:
W7074 D 19

SIZE: 12
SHAPE: I
TRANS.: TL/O
COLOR: Colorless to black
LUSTER: SV/D
TYPE: TCN

COMMENTS:

S-88-53325

W7D19

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074 D
W7074 E 3

SIZE: 11
SHAPE: S
TRANS.: O
COLOR: Black
LUSTER: SV
TYPE: TCN

COMMENTS:
Pollen grain?
W7074 E 10

SIZE: 30x20
SHAPE: I
TRANS.: TL
COLOR: Orange
LUSTER: R
TYPE: TCN

COMMENTS:
Related to W7074E11
SIZE: 10
SHAPE: I
TRANS.: TL
COLOR: Orange
LUSTER: R
TYPE: TCN

COMMENTS:
Largest particle in a field of particles.
Related to W7074E10
W7074 E 15

SIZE: 10x7
SHAPE: I
TRANS.: O
COLOR: Black
LUSTER: D
TYPE: TCN
COMMENTS:

S-88-53334

NASA JSC
COSMIC DUST PROGRAM
W7074E

COUNTS

ENERGY (KEV)

0.0  10.0
W7074 E 16

SIZE: 12x8
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCN

COMMENTS:

S-88-53335

NASA JSC
COSMIC DUST PROGRAM
W7074E

COUNTS

ENERGY (KEV)

MG
SI
S
CA
FE

0.0
10.0

125
W7074 F 1

SIZE: 65x20
SHAPE: I
TRANS.: TL/O
COLOR: Colorless to black
LUSTER: SV/D
TYPE: TCN

COMMENTS:
May be related to W7074F2 and F3

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074F
W7074 F 2

SIZE: 20x15
SHAPE: I
TRANS.: TL/O
COLOR: Colorless to black
LUSTER: SV/D
TYPE: TCN
COMMENTS: May be related to W7074F1 and F3

S-88-53338

NASA JSC
COSMIC DUST PROGRAM
W7074F

COUNTS

ENERGY (KEV)
W7074 F 3

SIZE: 12
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCN

COMMENTS:
May be related to W7074F1 and F2
SIZE: 30x25
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCN
COMMENTS:
W7074 F 7

SIZE: 35x22
SHAPE: I
TRANS.: TL
COLOR: White to yellow
LUSTER: R
TYPE: TCN

COMMENTS:

S-88-53343

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074F

12500

ENERGY (KEV)
W7074 F 8

SIZE: 18
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCN
COMMENTS:

S-88-53344

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074F
W7074 F 10

SIZE: 30
SHAPE: I
TRANS.: TL
COLOR: White to yellow
LUSTER: R
TYPE: TCN
COMMENTS:

S-88-53346
W7074 G 4

SIZE: 60x20
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCN

COMMENTS:
- Field of particles
W7074 G 6

SIZE: 14
SHAPE: I
TRANS.: TL
COLOR: White to yellow
LUSTER: R
TYPE: TCN
COMMENTS:

S-88-53358

20000 COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074G

ENERGY (KEV)

0.0 10.0
W7074 G 7

SIZE: 12
SHAPE: S
TRANS.: T/TL
COLOR: Brown
LUSTER: SV
TYPE: TCN

COMMENTS:
Pollen grain?
W7074 G 11

SIZE: 14x12
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCN
COMMENTS:

NASA JSC
COSMIC DUST PROGRAM
W7074G
W7074 H 1

SIZE: 28x20
SHAPE: I
TRANS.: O/TL
COLOR: Yellow to black
LUSTER: R/D
TYPE: TCN
COMMENTS:

[Graph showing energy counts for various elements: Si, Al, Mg, S, Ca, Ti, Fe]

NASA/JSC
COSMIC DUST PROGRAM
W7074H
W7074 H 3

SIZE: 35x25
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCN

COMMENTS:
Related to W7074H4
W7074 H 4

SIZE: 45x35
SHAPE: I
TRANS.: TL
COLOR: Yellow
LUSTER: R
TYPE: TCN

COMMENTS:
Related to W7074H3
W7074 H 7

SIZE: 12x7
SHAPE: I
TRANS.: O
COLOR: Brown
LUSTER: SM/D
TYPE: TCN
COMMENTS:

S-88-53376

W7H7

NASA JSC
COSMIC DUST PROGRAM
W7074H

COUNTS

ENERGY (KEV)

0.0 10.0

SI AL S CA K FE ZN
W7074 H 14

SIZE: 10x8
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: D
TYPE: TCN
COMMENTS:

S-88-53383

NASA JSC
COSMIC DUST PROGRAM
W7074H

COUNTS

ENERGY (KEV)

0.0 10.0

142
W7074 H 15

SIZE: 21
SHAPE: I
TRANS.: T
COLOR: Colorless
LUSTER: V
TYPE: TCN
COMMENTS:

Counts

NASA JSC
COSMIC DUST PROGRAM
W7074 H

COUNTS

ENERGY (KEV)

10.0

0.0
W7074 I 2

SIZE: 32x25
SHAPE: I
TRANS.: TL/O
COLOR: White
LUSTER: R/D
TYPE: TCN

COMMENTS:

COUNTS

NASA JSC
COSMIC DUST PROGRAM
W7074I

ENERGY (KEV)

144
SIZE: 24x15
SHAPE: I
TRANS.: TL
COLOR: Orange to brown
LUSTER: R/D
TYPE: TCN
COMMENTS:
SIZE: 60x14
SHAPE: I
TRANS.: TL/O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCN
COMMENTS:
W7074 I 7

Size: 45x24
Shape: I
Trans.: TL/O
Color: White to yellow
Luster: R/D
Type: TCN
Comments:

S-88-53390

Counts CR Si Al S

Energy (keV) 10.0

NASA JSC COSMIC DUST PROGRAM W7074I

Counts

0.0 10.0

147
SIZE: 20x10
SHAPE: I
TRANS.: O
COLOR: Brown to black
LUSTER: SM/D
TYPE: TCN
COMMENTS:
ALUMINUM OXIDE SPHERES
W7074 C 18

SIZE: 8
SHAPE: S
TRANS.: T
COLOR: Yellow
LUSTER: V
TYPE: AOS
COMMENTS:

S-88-53305

20000

COUNTS

EN Energy (KeV)
W7074 C 19

SIZE:  6
SHAPE:  S
TRANS.:  T
COLOR:  Yellow
LUSTER:  V
TYPE:  AOS
COMMENTS:
W7074 C 20

SIZE: 6
SHAPE: S
TRANS.: T
COLOR: Yellow
LUSTER: V
TYPE: AOS
COMMENTS:

COUNTS

ENERGY (KEV)

NASA JSC
COSMIC DUST PROGRAM
W7074C

152
W7074 C 21

SIZE:  4  
SHAPE:  S  
TRANS.:  T  
COLOR:  Yellow  
LUSTER:  V  
TYPE:  AOS  
COMMENTS:

S-88-53308