Meteorites and Minerals Associated With The Origin of Life

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CHERT FROM SILICA GEL
KAOLINITE
Locality NWA 7034 "BLACK BEAUTY"
Date found 2011 - MOROCCO
Type MARTIAN BASALTIC BRECCIA
Total Wt. ~1kg
Notes 0.235g
Mile High Meteorites Collection
www.milehighmeteorites.com
PYRITE
BLACK BEAUTY METEORITE
Locality MURCHISON, AUSTRALIA
Date fell Sept. 28 1969
Type CM2
Total Wt. 100 Kg
Notes Contains Amino Acids and additional building blocks of life
Mile High Meteorites Collection
www.milehighmeteorites.com
BRUCITE
MURCHISON METEORITE
NAME: CAMEL DONGA
TYPE: Achondrite-Eucrite
FOUND / FELL (DATE): 1984
LOCATION: Western Australia
TOTAL KNOWN WEIGHT: Over 30 Kilos
SPECIMEN DESCRIPTION: Whole
SPECIMEN WEIGHT: 1.45g
NOTES: From Vesta!
Locality Allende, Mexico
Date Fell Feb. 8, 1969
Type CV3
Total Wt.
Notes CAI's older than Sun
VESTA METEORITE
ALLENDE METEORITE
MAGNETITE
NAKHLA
NWA NAKHLITE 1.1gr.
OPALINE SILICA
MONTMORILLONITE
PYROXENE
GEYSERITE
WULFENITE
TOURMALINE
COLEMANITE
OLIVINE
SCHREIBERSITE
PUMICE
SERPENTINE
ORGUEIL
Orgueil 0.01g
TISSINT

METEORITES AND MINERALS ASSOCIATED WITH THE ORIGIN OF LIFE

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MINERALS

PYRITE- Wachtershauser el al (1)
GEYSERITE- Campbell et al (2)
OPALINE SILICA- Deamer et al (2)
CHERT(FROM SILICA GEL)-Westall et al (9)
PUMICE-Brasier et al (3)
MONTMORILLONITE- Cairns-Smith et al (3)
KAOLINITE-Hashizume et al (3)
OLIVINE- Russell et al (1)
PYROXENE-Russell et al (1)
SERPENTINE-Russell et al (1)
MAGNETITE-Russell et al (1)
BRUCITE-Russell et al (1)
WULFENITE-Benner et al (4)
TOURMALINE-Benner et al (4)
COLEMANITE-Benner et al (4)

METEORITES

MURCHISON(Amino Acids)-Kvenvolden et al (6)
ALLENDE(CAI's)-Clarke et al (6)
TISSINT(Piece of Mars)- Steele et al (5)
ORGUEIL(Piece of Comet)- Gardinier et al (6)
CAMEL DONGA(Piece of Vesta)- Alexander et al (7)
TAMBO QUEMADO (Schreibersite)-Pasek et al (8)
BLACK BEAUTY(Piece of Mars)-Agee et al (5)
NAKHLA(Piece of Mars)- Bridges et al (5)

context for origin of life

1) under water to protect from impacts on surface
2) on surface to get wet/dry cycles
3) compartments on surface for organic molecules
4) enough dry land to create boron to help RNA
5) method to transfer Mars life to Earth
6) method to transfer organic molecules to planet
7) method to transfer water to planet
8) method to transfer phosphorus to planet
9) protection and wet/dry cycles

Tissint
0.193g
Murchison
0.16g

MINI VERSION OF EXHIBIT OF METEORITES AND MINERALS ASSOCIATED WITH THE ORIGIN OF LIFE

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The Origin of Life explained in minutes to the general public.

I have created this mini version of my Meteorite and Mineral Exhibit for educating people about the Origin of Life. Here is the story.

It is commonly accepted you need three conditions for life to start-

A source of Organic Molecules
A solvent (water)
A source of energy to power the start of life

The piece of the Murchison meteorite (middle right) contains organic molecules
The crust of a rocky planet contains enough water to create an ocean
The sources of energy and location for the start of life have changed over 50 years

In the 70's it was thought to be clay (montmorillonite- top left)
In the 80's it was thought to be black smoker vents on the ocean floor (pyrite- middle left)
In the 2000's it was thought to be white smoker vents on the ocean floor (Serpentinization Minerals Olivine Serpentine Magnetite Brucite bottom row)
In 2013 it was thought to be Mars because it had enough dry land to create boron to stabilize ribose in RNA (A meteorite like Tissint- middle left bringing life to Earth)
In 2015 it was thought to be surface hot springs (sinter- top left in pink)
In 2016 it was thought to be volcanic island splash pools (opaline silica- middle right)
In 2017 it was thought to be sediment at the bottom of the ocean in silica gel which precipitates into chert (upper right)

In future years there will be new sources of energy and locations for the start of life from new theories.