

METALLO-ORGANIC DECOMPOSITION FILMS

JET PROPULSION LABORATORY

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Metallo-Organic Decomposition (MOD) Films

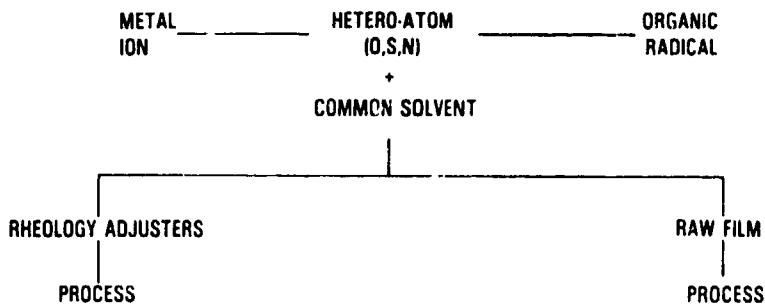
Introduction

Materials

Process

Status

What are Metallo-Organic Compounds?



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Advantages of MOD Compounds

- Generic synthesis procedures
- High solubility in organic solvents
- High uniform metal content
- Lower firing temperatures
- Decompose without melting or leaving a carbon deposit
- Stable under ambient conditions
- Non-toxic — do not produce toxic decomposition products

Disadvantages of MOD Compounds

- Low inorganic content
- Limited information available on pure compounds
- Large volume of volatiles

Molecular Design Criteria

- As the chain length of the organic radical increases:
 - (1) The solubility of the compound in organic solvent increases
 - (2) The metal content of the compound decreases
- The solubility of the compound increases if the organic radical is branched

PLENARY SESSIONS

Compounds Formulated

2-ETHYLHEXANOATES

Bi, Cd, Co, Cr, Cu, Ga, In, Ir, Ni, Pb, Rh, Ru, Si, Sn, Y, Zn, Zr

AMINE 2-ETHYLHEXANOATES

Au, Pt

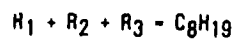
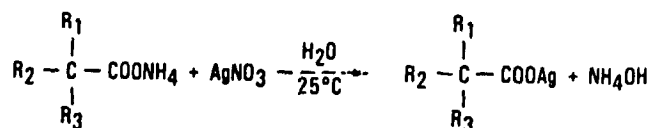
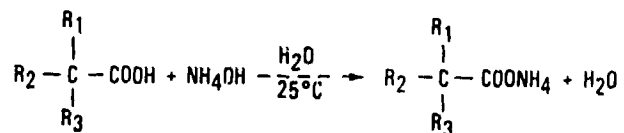
NEODECANOATES

Ag, Ba

OTHER

B pyridine
Pd acetate
Sb sulfoxide
Ti 2-ethylhexoxide

Reactions

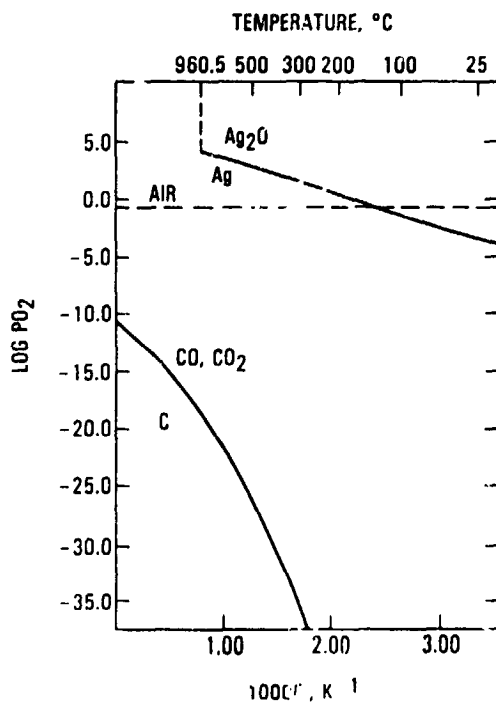


Wt % SILVER: 38.7

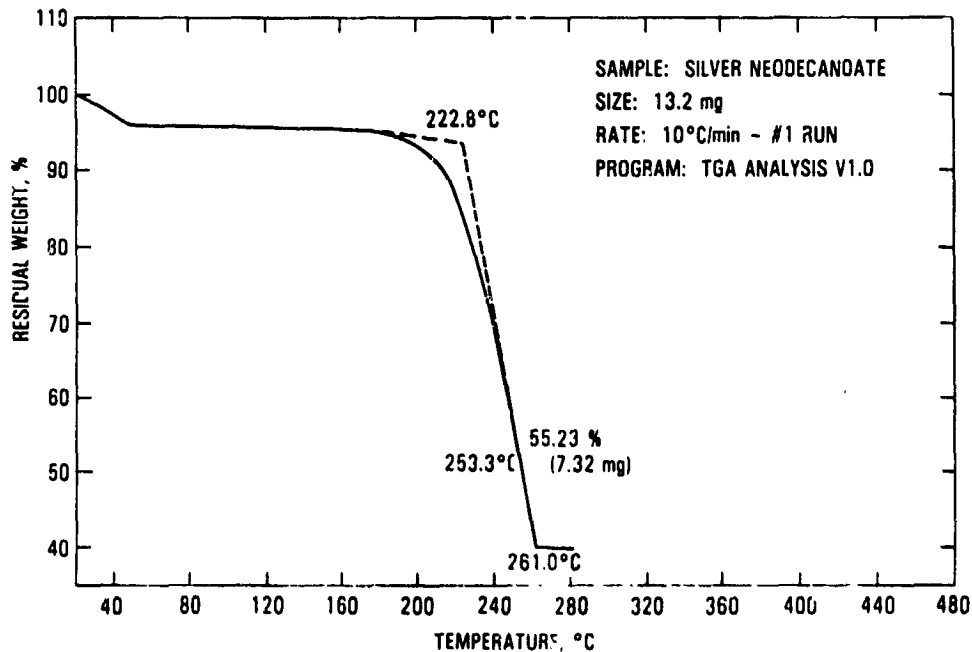
FORM: WHITE SOLID

SOLUBILITY: AROMATIC SOLVENTS

Phase Stability Diagram for the Ag-C-O System

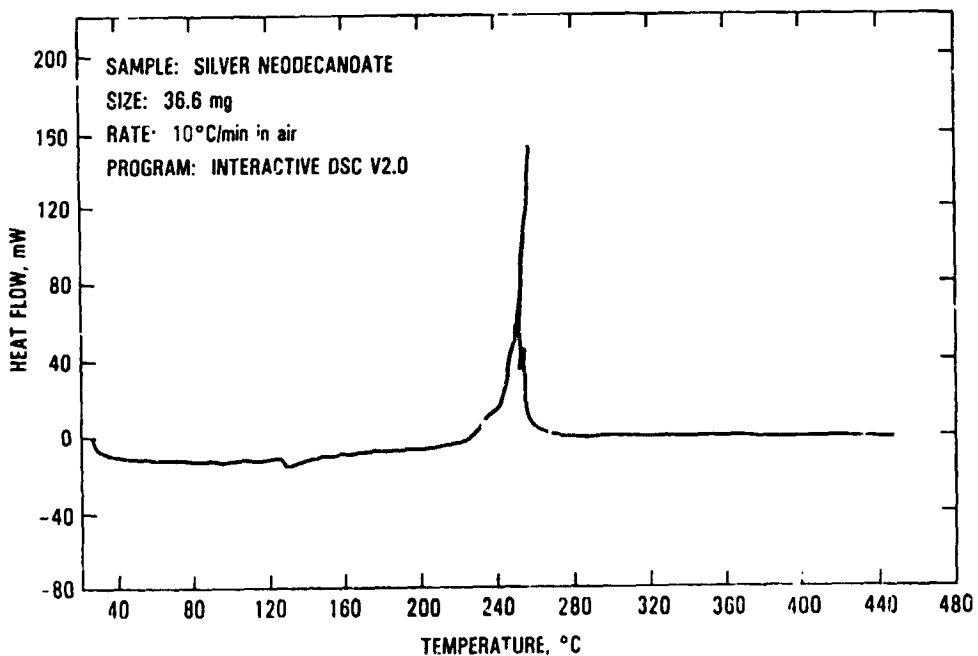


TGA



PLENARY SESSIONS

DSC



Status

- **Materials**

Ag	AgNi
AgPt	AgCo
AgBiPt	AgCr
AgBi	

- **Processes**

- **Application methods**

- Thick-film screening
- Ink-jet printing
- Spin-on
- Spray
- Dip

- **Pyrolytic decomposition**

- Resistance furnace
- Coherent light
- Incoherent light

PLENARY SESSIONS

- **Applications**
 - Photovoltaic devices
 - VLSI devices
 - Hybrid microelectronics
 - Hermetic sealing
- **Technology transfer:**
 - New technology disclosures
 - Papers
 - ISHM
 - SPIE
 - ECS
 - MRS
 - Industry availability