



Rh

ADNF

En

DD

* DA KL DL K S. GK Hb

U.S. Naval Research Laboratory, Washington, DC 20375, USA

J. H. He

Nova Research Inc., Alexandria, VA, USA

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ENEA, Frascati Italy

Abstract

The present study is a preliminary investigation on the synthesis of the compound Rh₁₀Ir₁₀ by the reaction of Rh and Ir with Pd. The results show that the compound Rh₁₀Ir₁₀ is formed at 1000°C in a vacuum.

Rh₁₀Ir₁₀

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Keywords: Rh, Ir, Pd

1. Introduction

The present study is a preliminary investigation on the synthesis of the compound Rh₁₀Ir₁₀ by the reaction of Rh and Ir with Pd. The results show that the compound Rh₁₀Ir₁₀ is formed at 1000°C in a vacuum.

*Enigma

Abstract
The present work describes the synthesis and characterization of a new class of polymeric materials based on the reaction of a diisocyanate with a poly(ether sulfone) (PES) containing a hydroxyl group. The resulting polyurethane (PU) was characterized by Fourier transform infrared (FTIR) and 1H NMR spectroscopy. The PU was also characterized by thermogravimetric analysis (TGA) and differential scanning calorimetry (DSC). The PU showed a glass transition temperature (Tg) of 100 °C and a thermal stability up to 400 °C.

Keywords: PU, PES, FTIR, 1H NMR, TGA, DSC

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2. Experimental

The synthesis of PU was carried out by the reaction of a diisocyanate with a poly(ether sulfone) (PES) containing a hydroxyl group. The reaction was carried out in a round-bottom flask equipped with a magnetic stirrer and a nitrogen atmosphere. The diisocyanate was added to the PES solution in a 1:1 molar ratio. The reaction mixture was stirred at room temperature for 24 hours. The resulting PU was precipitated into methanol and dried under vacuum at 60 °C for 24 hours.

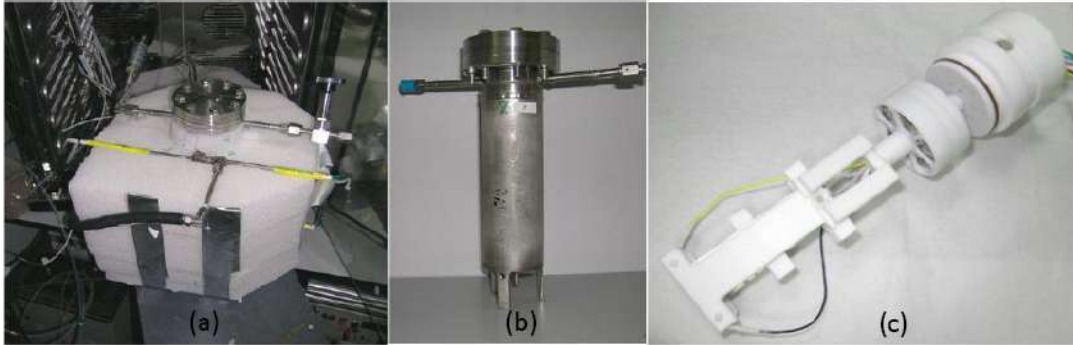


Figure 1. Photographs of the detector components.

The detector is composed of a central stainless steel tube (CST) with a diameter of 10 mm and a length of 1.5 m. The CST is surrounded by a layer of 10 cm of polyethylene (PE) moderator. The detector is also equipped with a 10 cm thick lead (Pb) shield. The detector is connected to a readout system via a series of cables. The readout system consists of a series of photomultiplier tubes (PMTs) connected to a series of electronic modules. The detector is also equipped with a series of temperature sensors to monitor the temperature of the moderator and the lead shield.

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$\pm 0.01^\circ\text{C}$

$10 \text{ m} \times 50 \mu\text{m}$

$\pm 0.1^\circ\text{C}$

$20 \text{ m} \times 110 \mu\text{m}$



Figure 2. (a) Experimental setup, (b) probe assembly, (c) probe assembly disassembled.

The probe assembly is made of stainless steel and is composed of a probe tip and a probe body. The probe tip is made of stainless steel and has a diameter of 2.00 mm, a length of 21.10 mm, and a mass of 2.500 g. The probe body is made of stainless steel and has a diameter of 6.35 mm, a length of 150 mm, and a mass of 1.000 g. The probe assembly is used to measure the temperature of the sample. The temperature is measured by a thermocouple (Type K) which is inserted into the probe tip. The temperature is measured at the tip of the probe with an accuracy of $\pm 0.001^\circ\text{C}$.

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3. Results and Discussion

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Table 1. Alloys
 in the E d H n
 series 00962 010. Table
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	E	HART	Tb
PdLD			
E	2	8	
Pt	9	7+2	
Hd	1		
SPI	7	1+5	
JM	1		
E	2		2+14
Ah			1
GS		1	
Tb	2 2	4	63
PdLE			
SPI	2	3+1	
JM	2		
E	3		
Ah		2	
GS		2	
Tb	4	11	15
kLD			
Pd0.25%B			1+1
Pd0.5%B			2
PE n			1
PdAu			1
NiCo			1
Pd5%Ru			2
Pd8%Pt1%Rh%			2
Pd0%Rh0%			1
NiPd			2
NiPdNi			1
Ni			3
Ni			3
Ta			2
Pt		6	5
Tb	6	2 8	34
Ni			
NiLE			1
PdKO	1		
PdH2SO			1
Tb		3	3
Pt			115

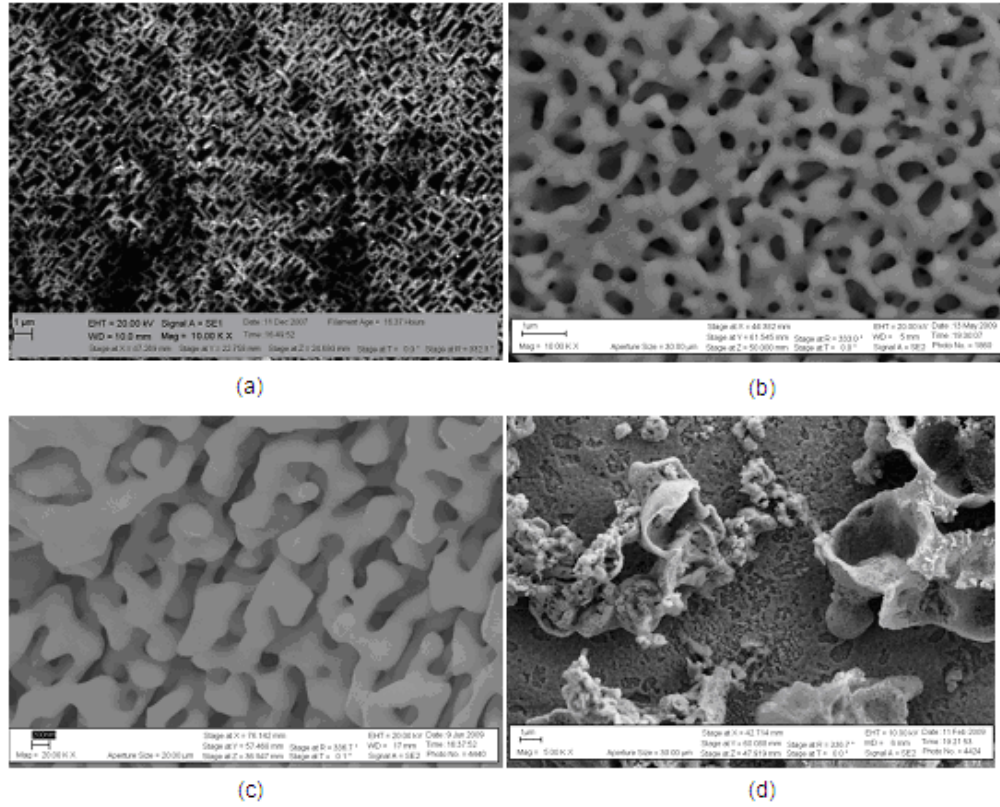


Figure 3. SEM images of Pd5k at different magnifications: (a) 10,000x, (b) 18,000x, (c) 20,000x, and (d) 5,000x.

the Pd5k film with 3] Th
 Pd5k 2 005.

The Pd5k film was prepared by
 (2 x) in Pd5k. The thickness
 of the film was 100 nm.
 The Pd5k film was prepared by
 the Pd5k film was prepared by
 the Pd5k film was prepared by
 the Pd5k film was prepared by

nickel D 2006

(100). The

High resolution
 TEM images at 15 kV
 (Pd5k film) were
 taken by the Pd5k

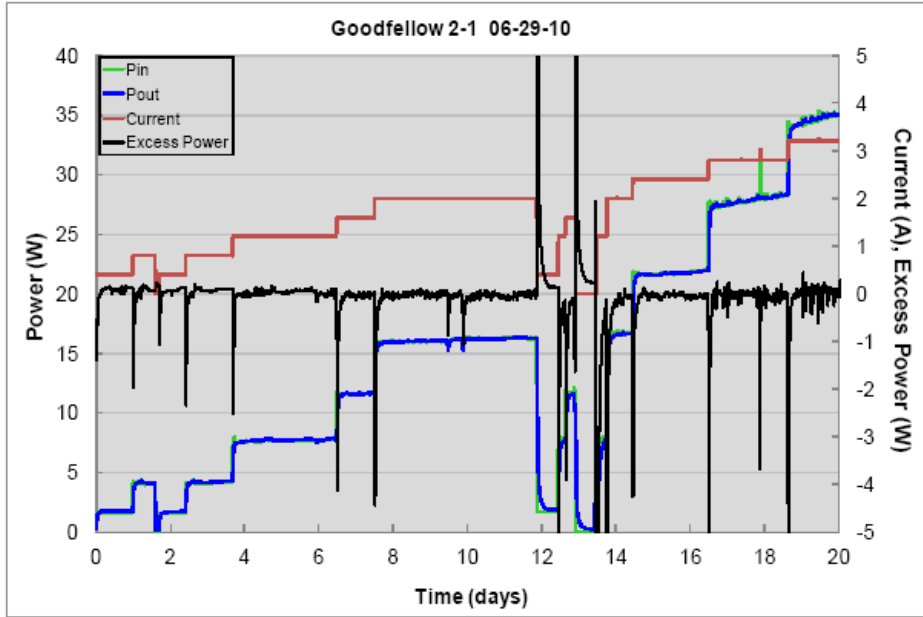


Figure 4. Plot of P_{in} (green), P_{out} (blue), Current (red) and Excess Power (black) vs Time (days). The temperature of the fuel was 2000 °C and the pressure was 1.0 MPa. The fuel was irradiated with a neutron flux of $1.0 \times 10^{16} \text{ n cm}^{-2} \text{ s}^{-1}$ and the total power was 3.2 W.

of Power (W) vs Time (days) is shown in Fig. 3.

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$$(P_o - P_i). \text{ The temperature of the fuel was 2000 }^\circ\text{C and the pressure was 1.0 MPa. The fuel was irradiated with a neutron flux of } 1.0 \times 10^{16} \text{ n cm}^{-2} \text{ s}^{-1} \text{ and the total power was 3.2 W. The fuel was irradiated for 20 days.}$$

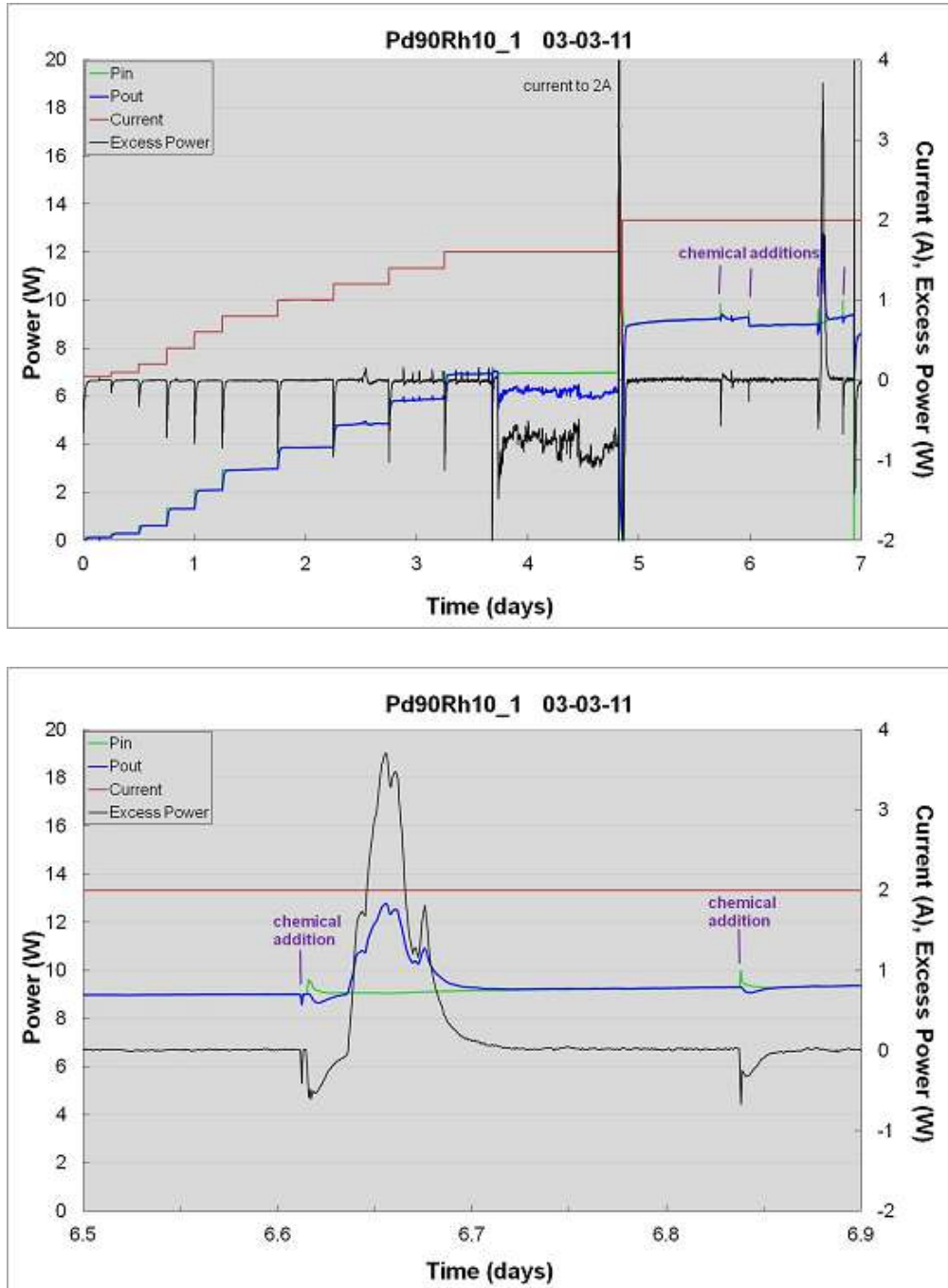


Figure 6. (a) Plot of P_{in} (green), P_{out} (blue), Current (red) and Excess Power (black) vs Time (days) for Pd90Rh10_1. (b) Zoomed-in view of the data from 6.5 to 6.9 days, showing peaks labeled "chemical addition".

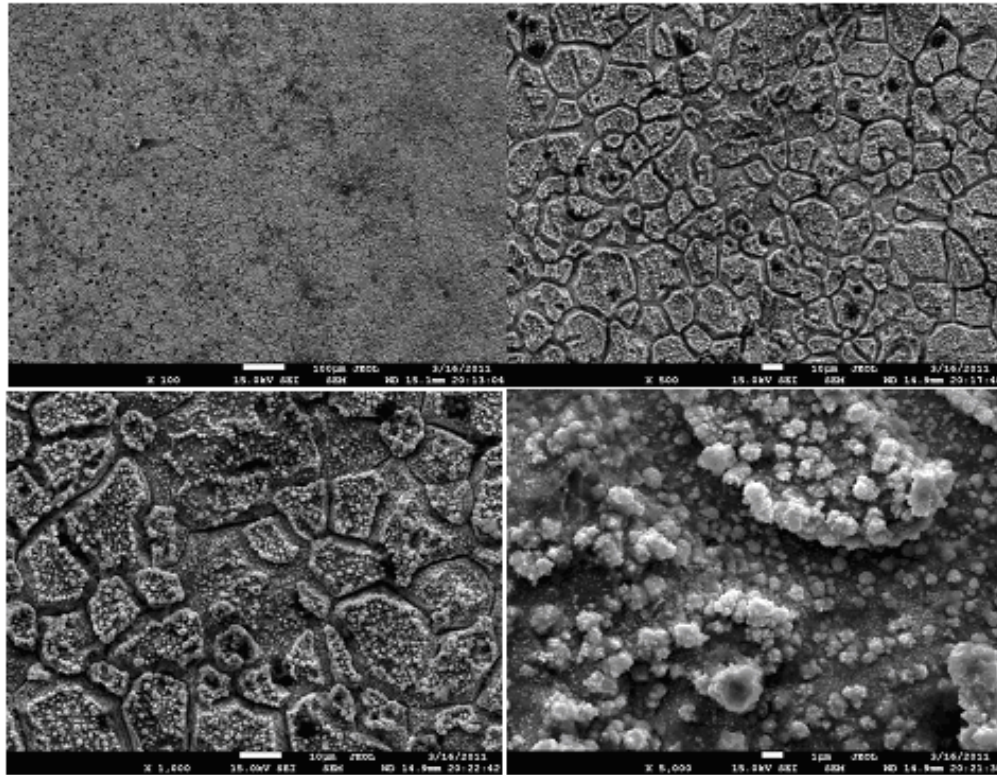


Figure 7. SEM images of Pd-9Rh10Co7Hf10Cr10Ni2Al9 alloy at magnifications of X100, X500, X1000, and X5000.

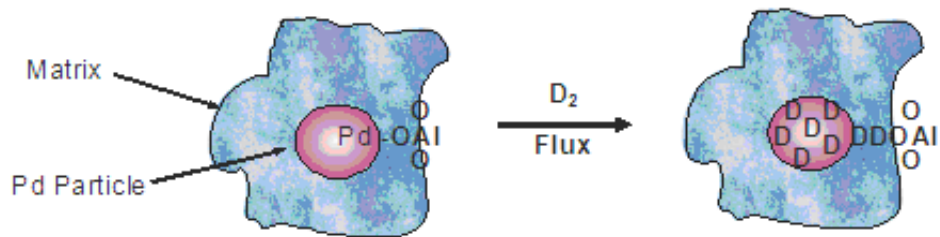


Figure 8. Schematic diagram of D2 diffusion into a Pd particle.

the total thickness
of the Pd film
is 100 nm. The
Pd film is
deposited on
the substrate
by sputtering.

The Pd film
is deposited on
the substrate
by sputtering
at a pressure
of 0.1 Pa and
a power of
100 W. The
deposition
rate is
approximately
1 nm/min.

Figure 1
shows the
cross-section
of the Pd
film on the
substrate.
The thickness
of the Pd
film is
approximately
100 nm.

2

4. Conclusions

The Pd film
is deposited
on the
substrate
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of 0.1 Pa and
a power of
100 W. The
deposition
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