

NASA Resident Office
Jet Propulsion Laboratory
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Pasadena, CA 91109



y to Attn of: **SJT (180-801)**

June 10, 1992

Cronin B. Vining
11738 Moorpark Street #J
Studio City, CA 91604

SUBJECT: NPO-18617/CHARACTERIZATION OF A PROMISING NEW THERMOELECTRIC MATERIAL: RUTHENIUM SILICIDE

I am pleased to inform you that the subject New Technology disclosure has been selected as a Class I NASA Tech Brief to be published in the NASA Tech Briefs Journal. All innovators of Class I Tech Briefs are entitled to receive a \$150 Award and Certificate.

In order to facilitate early processing and minimize errors in personal data, please complete the enclosed form and return the form to me **AS SOON AS POSSIBLE**. All forms **NOT** returned to me will prohibit the submission of this information to the NASA Headquarters Inventions and Contributions Board. Please note that the submission and approval cycle takes several months.

For your convenience, I have also enclosed a return mailing envelope.

If you should have any questions regarding the above Tech Brief, please feel free to call me at (818) 354-4862.

A handwritten signature in cursive script that reads "Arif Husain". The signature is written in black ink and is positioned above the printed name.

Arif Husain
Technology Utilization Officer

Enclosures (2)

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TUNS

NTR EVALUATION FORM DETAILED REPORT

REPORT: T22A
PAGE 1

AS OF DATE: 05/12/92

RECEIVED

MAY 19 1992

FILE NUMBER: SRI-10142 NTR NO: NPO-18617 CENTER NAME: JPL-CA

JPL TU OFFICE

RELEASE TO CENTRAL DB (Y/N) : Y DATE RELEASED TO CENTRAL: **/**/**

FILE:
CHARACTERIZATION OF PROMISING NEW THERMOELECTRIC MATERIAL:
RUTHENIUM SILICIDE

DATE RECEIVED FOR EVALUATION: 09/30/91 DATE RETURNED TO TUO: 05/12/92
COMMENDED CLASSIFICATION : 1.0 RECLASSIFICATION NO :
TEMPERATURE (S OR I) :

EVALUATION TYPE: 2 EVALUATION DATE : 05/11/92
EVALUATOR (1) NAME: ANGEL SANJURJO
EVALUATOR (1) ORGANIZATION:
SRI

DATE TO EVAL (1): 03/10/92 DATE DUE FROM EVAL (1): 03/31/92
REASON FOR DELAY :

EVALUATOR (2) NAME:
DATE TO EVAL (2): **/**/** DATE DUE FROM EVAL (2):

EVALUATOR COMMENTS:
This technology is both novel and significant and should have a sizeable audience. Publication is encouraged.

EVALUATION REPORT:
NOVELTY: The authors identified, prepared and tested ruthenium silicide (Ru₂Si₃) for thermoelectric applications. Samples, produced by arc melting, demonstrated that B and Rh are p and n dopants, respectively. Better samples of Ru₂Si₃ crystallites (containing some other phases) were obtained by crystal growth from the melt using a Bridgman technique. The test results obtained, including the effect of temperature on Seebeck coefficient, Hall Mobility, and electrical and thermal resistivity, constitute a preliminary demonstration of the potential of transition-metal-silicides as thermoelectric materials. The work is certainly novel.
SIGNIFICANCE: The subject work is of great interest and significance.

May 20, 1992

TO: Cronin B. Vining
FROM: Norman L. Chalfin (x46833) MS 156-211
SUBJECT: NASA Tech Brief publication evaluation for NPO-18617

As part of the procedures of the Technology Utilization Office, all new technology reports submitted to the Patent Office are automatically reviewed by Stanford Research Institute (under contract to NASA) for NASA Tech Brief publication.

The following criteria are considered in this review:

- **Novelty:** Does the report describe an innovation, discovery, modification or improvement, regardless of patentability?
- **Technical Significance:** Does the report add to the general body of knowledge in the subject area? Will it interest an audience in a related area?
- **Utility:** Are there any **non-aerospace** or **commercial** applications?

In the attached evaluation, the reviewer recommends whether to publish (see classification ratings below) and explains why. You, as the innovator(s), have an opportunity to comment on the evaluation.

The reviewer assigned the following classification to NPO-18617:

- Class 1.0, 1.1, 1.2:** Publication is recommended. No comments are necessary. You will be receiving a draft of the proposed Tech Brief to approve in the future. You will also receive a letter from Arif Husain, NASA Resident Office-JPL, verifying your home address and social security number in order to process your \$150.00 award.
- Class 2.0:** This report will **not** be published as a NASA Tech Brief unless we upgrade it to Class 1.0 based on your comments.
- Class 3.0:** This report will **not** be published as a NASA Tech Brief unless we upgrade it to Class 1.0 based on your comments.
- Class 4.0:** Additional information is needed to enable a thorough evaluation.

Only Class 1.0, 1.1 and 1.2 evaluations result in NASA Tech Brief publication.

Class 2, 3 and 4 evaluations may be upgraded to Class 1.0. Your comments should address the reviewer's grounds for denying, deferring or constraining publication. Your response (verbal or written) is necessary in order for the report to be upgraded to a Class 1.0. Thank you.