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PHOTOVOLTAIC ENVIRONMENTAL HEALTH AND SAFETY ELECTRONIC BULLETIN BOARD SERVICE

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ABSTRACT

An electronic bulletin board system (BBS) has been established by the Biomedical and Environmental Assessment Group, Brookhaven National Laboratory, for the Photovoltaics Technology Division, U.S. Department of Energy. The purpose of the BBS is to provide a forum for the ongoing exchange of information relating to the environmental, health and safety aspects of photovoltaic cell manufacture. This BBS is available, at no charge, to organizations engaged in photovoltaic cell research, development and production. Individuals with access to a microcomputer, modem and communications software can call into the BBS and join ongoing discussions. Users of the BBS may also electronically access reports, models and databases which relate to the environmental, health and safety aspects of photovoltaic cell manufacture.

INTRODUCTION

A photovoltaic environmental, health and safety electronic bulletin board system (BBS) has been established by the Biomedical and Environmental Assessment Group, Brookhaven National Laboratory. The system is sponsored by the Photovoltaics Technology Division, U.S. Department of Energy. The purpose of the BBS is to provide a forum for the exchange of information relating to the environmental, health and safety aspects of photovoltaic cell research, development and production. Individuals with access to a microcomputer, modem and communications software can call the BBS and join ongoing discussions. Users of the BBS may also access reports, models and databases which relate to the environmental, health and safety aspects of photovoltaic cell manufacture. The BBS is available, at no charge, to organizations engaged in photovoltaic cell research, development and production.

FEATURES

Major features of the Photovoltaic Environmental, Health and Safety BBS include:

- **BULLETIN BOARD:** A forum for public discussion of topics relating to the environmental, health and safety aspects of photovoltaic cell manufacture. Callers can read messages left by other users, and follow or join ongoing discussions. Questions or comments can be directed to all users or to an individual.
- **PUBLIC BULLETINS:** Messages of interest to all users, including system news, notification of meetings and notification of new models or reports available on the system.

- **MAIL:** This section allows private communication between users of the BBS.
- **SPECIAL INTEREST GROUPS:** Special Interest Groups are sections of the BBS devoted to the discussion of specific topics, including silicon, III-V and II-VI compounds.
- **SYSTEM INFORMATION:** Help with using the BBS.
- **FILES FOR LISTING OR DOWNLOADING:** Files are available for listing to the screen or downloading to a user's computer. Available files include environmental transport models, LOTUS templates and data, documents from the U.S. Environmental Protection Agency on the toxicology of selected compounds used by the photovoltaics industry, and other documents of interest.

LOGGING INTO THE BBS

To access the BBS you need a personal computer, a modem, and a communications program. The number of the BBS is (516)282-2489, FTS 666-2489. The system can answer calls at 300, 1200 or 2400 baud. It expects your communications program to communicate using eight data bits, no parity, and one stop bit. Other parameters, including terminal width, line feeds, and number of nulls, can be set for your computer after you have logged onto the system for the first time.

The first time you call the BBS you will be asked a series of questions to register with the system. After registering you will encounter the top level menu, and have access to all of the BBS capabilities. On subsequent logons, you will be prompted for your name and password, and will then encounter the top level menu.

The operation of the BBS is self-explanatory. Menus and prompts will lead you through the use of the system. Figure 1 shows the first menu encountered after logging onto the BBS.

FILES AVAILABLE ON THE BBS

A number of documents, programs and data files are available to users who access the BBS. These files can be listed to the screen, or downloaded to a user's computer. Figures 2 through 5 are examples of menus from the BBS showing the kinds of files available for listing or downloading.

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Figure 1. First Menu

<G>oodbye, <X>pert, <T>ime, <F>ormat Terminal

ulletins
<I>nfo....System Information and Help

<R>ead Messages on the Bulletin Board
<Q>uickscan Messages on the Bulletin Board
<L>eave Messages on the Bulletin Board

<M>ail....Electronic Mail Section
<S>IGS....Special Interest Groups

<D>ownload....Files Available for Downloading/Viewing

Command:

Figure 2. Downloading/Viewing Menu

Files Available for Downloading and Viewing:

<G>oodbye, <T>ime, <X>pert, <->Top Menu

<1> Listings of chemical specific information from the USEPA IRIS database
<2> Models and LOTUS 123 spreadsheets
<3> Reports and other text files

Command:

Figure 3. Listings From the USEPA IRIS Database

Listings from the USEPA IRIS (Integrated Risk Information System) are available for a number of chemicals. The listings include information on the status of the data for a chemical, estimates of toxic and carcinogenic risks, and a description of the regulatory actions under which the substance is controlled.

- <1> Description of the IRIS System
- <2> Cadmium
- <3> Lead
- <4> Arsenic
- <5> Copper
- <6> Selenious acid
- <7> Selenourea
- <8> EPA Rfd Document
- <9> Other EPA background documents

Command:

Figure 4. Models and LOTUS 123 Templates

NYS-MAC Template:

- <1> Directions on using a LOTUS template to calculate maximum ground-level ambient concentrations for routine air emissions
- <2> The Template for the NYS-MAC model

Chemical Data Base:

- <3> Description of Photovoltaic chemical data base
- <4> The chemical data base

PVPUFF Model:

- <5> Description of the PVPUFF gaussian puff dispersion model
- <6> The FORTRAN code for PVPUFF
- <7> The executable code for PVPUFF
- <8> A test data file

Command:

Figure 5. Available Reports

Reports and Other Text Files:

- 1> Photovoltaic Bibliography -- Environmental Health and Safety Project, Brookhaven National Laboratory
- 2> SERI Standards for the Safe Handling, Use and Monitoring of Toxic Gases, 10/2/89, Solar Energy Research Institute

Command:

BULLETIN BOARD TRAFFIC

The Photovoltaics BBS can facilitate networking and communication among professionals in the Environmental Health and Safety community. The medium of the BBS allows the exchange of information and ideas, and the development of a wide range of contacts among a varied user community. Current users of the BBS include representatives from industry, universities, Federal agencies and national laboratories. Ongoing discussions and current bulletins include notification of meetings and relevant papers in the literature, discussions concerning the safe handling of particular materials, and suggestions concerning appropriate parameters for use in environmental transport modeling. Figure 6 presents some examples of messages left on the BBS.

USER'S MANUAL

More detailed instructions on accessing and using the Photovoltaic Environmental, Health and Safety BBS are available by writing to:

Anne F. Meinhold
System Operator
Biomedical and Environmental Assessment Group
Building 475
Brookhaven National Laboratory
Upton, New York 11973
(516) 282-2019

Figure 6. Examples of BBS Messages¹

MSG #7 *Bulletin Board*

FROM: ---

TO: ALL

SUBJ: Combustion of Arsine and Phosphine

An interesting article on combustion of arsine and phosphine effluent streams by B. Elliot, F. Balma and F. Johnson has just appeared in the January issue of Solid State Technology, pp. 89-92.

MSG #12 *Bulletin Board*

FROM: ---

TO: ---

SUBJ: Arsine Vapor Cloud Modeling

We are performing some vapor cloud modeling of arsine vapor using the SLAB dispersion model. I am trying to obtain some of the input parameters needed for the model. They are as follows:

Vapor Heat Capacity at constant pressure (J/Kg - degrees K)

Heat of Vaporization (J/Kg)

Liquid Heat Capacity (J/Kg - degree K)

Saturation Pressure Constants A, B and C.

MSG #13 *Bulletin Board*

FROM:---

TO:---

SUBJ: Reply to MSG #12 (Arsine Vapor Cloud Modeling)

We are using the following values which are surrogates extrapolated from values existing in the literature on similar modeling for arsine hydrides.

Vapor Heat Capacity (J/Kg-K): 600

Heat of Vaporization (J/Kg): 3.9E+05

Liquid Heat Capacity (J/Kg-K): 1300

Saturation Vapor Pressure:

We are using the following formula

$\log(\text{SVP}) = -0.2185 A / T + B$

where A=8065, B=8.5

¹ Names have been deleted from this sample printout.

Questions and suggestions concerning the content of the BBS should be directed to:

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