PennState College of Earth and Mineral Sciences
Earth and Mineral Sciences Energy Institute
Published on *EMS Energy Institute* (http://www.energy.psu.edu)

Introduction Department of Energy Coal Sample Bank & Database

Penn State is maintaining a suite of 38 well preserved DECS samples, collected in an ongoing effort begun in 1989, in addition to about 500 PSOC samples dating back to April 1967. The coals represent a wide spectrum of the major coalfields of the United States and were selected in order to achieve a useful distribution of important coals by rank, geologic province, maceral composition, sulfur content and forms, and ash yield and composition. Due consideration was also given to the prior use of these coal by researchers and to their economic importance. The DECS coals in the Penn State Coal Sample Bank listed on the right are the samples recommended for research owing to more efficient preservation techniques. PSOC samples have historical value, but their preservation is suspect. Most were collected as full-seam channel samples (Chan-Seam); however, drill cutting (Drll-Seam), working section of seam (Chan-Work), bench (Chan-Bnch), lithotype (Chan-Lith), run-of-mine (ROM), cleaning plant (Cleaning-Plt.) and Grab samples were also acquired.

DOE Coal Sample Bank

ASTM Sample Sample	Seam	Rank	Type	State	County	Year	Ash, dry	S,	Btu/lb,	C,	H,
DECS-1	Bottom	subC	Chan-Seam	TX	Freestone	1989	15.8				
DECS-2*	Illinois #6	hvCb	Chan-Seam	IL	Randolph	1989	16.2		4.5		
DECS-3	Coal Basin M	mvb	Chan-Seam	CO	Gunnison	1990	5.4				
DECS-4	Blue	hvCb	Chan-Seam	NM	McKinley	1990	6.2				
DECS-5	Hiawatha	hvCb	Chan-Work	UT	Sevier	1990	8.5				
DECS-6	Blind Canyon	hvAb	Chan-Work	UT	Emery	1990	5.8				
DECS-7	Adaville #1	hvCb	Chan-Seam	WY	Lincoln	1990	4.1				
DECS-8	Smith-Roland	subC	ROM	WY	Campbell	1990	13.8				
DECS-9	Dietz	subB	Drll-Seam	MT	Bighorn	1990	6.4				
DECS-10	Rosebud	subB	Chan-Work	MT	Rosebud	1990	12.6				
DECS-11	Beulah	ligA	Chan-Seam	ND	Mercer	1990	9.6				

DECS-12*	Pittsburgh	hvAb	Chan-Seam	PA	Greene	1990	10.3	1.1
DECS-13	Sewell	mvb	Chan-Seam	WV	Greenbrier	1990	4.	
DECS-14	Upper Kittanning	hvAb	Chan-Work	WV	Barbour	1990	10.	
DECS-15	Lower Sunnyside	hvAb	Chan-Seam	UT	Carbon	1991	10.	
DECS-16	Blind Canyon	hvAb	Chan-Work	UT	Emery	1991	13.	
DECS-17	Blind Canyon	hvAb	Chan-Sect	UT	Emery	1991	6.	
DECS-18	Kentucky #9	hvBb	Chan-Seam	KY	Union	1991	12.	
DECS-19	Pocahontas #3	lvb	Chan-Seam	VA	Buchanan	1991	4.	
DECS-20	Elkhorn #3	hvAb	Chan-Seam	KY	Floyd	1991	5.	
DECS-21	Lykens Valley #2	an	Chan-Seam	PA	Columbia	1992	11.	
DECS-22	Upper Kittanning	hvAb	Chan-Lith	PA	Armstrong	1993	23.	
DECS-23*	Pittsburgh	hvAb	Chan-Seam	PA	Washington	1994	9.4	3.8
DECS-24*	Illinois #6	hvCb	Chan-Seam	IL	Macoupin	1994	13.4	5.5
DECS-25	Pust	ligA	Chan-Seam	MT	Richland	1994	11.	
DECS-26	Wyodak	subB	ROM	WY	Campbell	1994	7.	
DECS-27	Deadman	subA	Drll-Seam	WY	Sweetwater	1994	13.	
DECS-28	Green	hvCb	Chan-Seam	AZ	Navajo	1994	6.	
DECS-29	Upper Banner #3	hvAb	Chan-Seam	VA	Dickenson	1995	6.	
DECS-30	Splash Dam	mvb	Chan-Seam	VA	Buchanan	1995	3.	
DECS-31	Pond Creek	hvAb	Chan-Seam	KY	Pike	1995	10.	
DECS-32	Stockton-Lewiston	hvAb	Chan-Seam	WV	Kanawha	1995	20.	
DECS-33	Ohio #4A	hvBb	Chan-Seam	OH	Meigs	1995	12.	

* Samples for which no 6 mm(-1/4 inch) coal remains

Sample Collection and Processing

DECS series samples are the newest and best-preserved samples in the collection, and should be chosen when possible for research requiring moderate quantities of sample. They were collected in 180 kg (400 lb.) quantities from recently exposed areas of active mines, where they were placed in 113 L (30 gal.) steel drums with high-density gaskets and purged with argon. As soon as feasible after collection, processing was performed in order to obtain representative subsamples. These were sealed under argon in foil multilaminate bags, which have been shown by annual monitoring to preserve samples very well, and are kept in refrigerated storage ($3^{o}C$).

DECS samples are available in packages of three nominal sizes:

- 50 g (3 oz.) at minus 0.25 mm(-60 mesh)
- 250 g (2/3 lb) at minus 0.85 mm (-20 mesh)
- 2.0 kg (5 lb) at minus 6 mm (-1/4 inch)

The 250g containers are the ones most often requested by research agencies. Some non-representative blocks of coal, sealed in argon and refrigerated, are also available for certain coals in the Sample Bank.

Older PSOC samples were collected similarly, but 300g samples were placed under argon in polyethylene bags which were then sealed in steel cans. Larger quantities were stored in polyethylene buckets or drums.

Analysis

Each of the DOE Sample Bank coals has been subjected to the following analytical procedures: proximate analysis, ultimate analysis, sulfur forms, calorific value, maceral analysis, vitrinite reflectance (VRo), ash fusion determination, free swelling index, Hardgrove grindability, major inorganic and trace elements, equilibrium moisture, Gieseler plasticity (where appropriate), and CO_2.

Sample Availability

Coal samples from the Penn State Sample Bank are available to members of the coal research community. Assistance can be given in identifying samples that match specifications or that best suit the research needs of the requestor.

A nominal fee is charged for samples:

- 50 g of -0.25 mm coal $10 ea
- 250 g of -0.85 mm coal $20 ea
- 2.0 kg of -6.0 mm coal $70 ea

Beyond this limit and for larger quantities or special preparation of samples, provision will be at cost to the requestor for preparation, mailing and handling. All requests for more than 5 kg (11 lbs.) of a single DECS or PSOC sample will be charged man hour costs associated with preparing larger samples.

Coal Database, Printouts and Searches

The data that have been assembled for each of the Sample Bank coals have been computerized and are available on request for an additional fee of $10.00 each. In addition to the analytical data described above, the Coal Database includes details on sample history, location, geology, and seam strata information.

Full (four to five page) printouts of data in 8 1/2¨ by 11¨ format can be provided for any sample. A one-page printout is available for some samples that contains sample location, geologic information, proximate analysis, equilibrium moisture, calorific value, sulfur forms, ultimate analysis, maceral composition, reflectance data, rank parameters, technologic properties, and physical properties. The full printout includes these data in more detail and calculated to various bases of expression, as well as major inorganic and trace element analyses, ash fusion temperatures, and CO2. Liquefaction, NMR, and Py/gc/ms results are also available separately for most DECS samples.

A staff of professionals at Penn State can undertake Database searched to identify samples meeting specified criteria. Simple searches resulting in tables of data or a set of printouts are done at a nominal cost to researchers. More extensive searches, statistics or electronic transmission of data sets can be performed; a charge may be made for this service.

Investigators can perform their own simple searches on our web site (see below). It includes limited data for all DECS samples and a selected subset of other Penn State samples. However, coal may not be available for all of the samples in this subset. Furthermore, samples for which the 2.0 kg -6.0 mm coal is no longer available are highlighted in red.

Ordering and Assistance

Request forms, a booklet describing the entire Penn State Coal Sample Bank and Database, and assistance in acquiring samples and data can be obtained from:

Coal and Organic Petrology Laboratories
The Pennsylvania State University
104 Academic Projects Building
University Park, PA 16802-2300
(814) 865-6543
Fax: (814) 865-3573
Email: n8h@psu.edu [1]

Site Map | Privacy and Legal Statements | Copyright | Accessibility Help | ©2015 EMS Energy Institute, The Pennsylvania State University

This site is maintained by the EMS Energy Institute. If you have questions about this site, please contact eiwebmaster@ems.psu.edu

Source URL: http://www.energy.psu.edu/copl/doesb.html

Links:
[1] mailto:n8h@psu.edu@psu.edu?subject=Coal%20Sample%20Bank%20web%20site%20question