

Automatized High Pressure Set-Up for Complex Research of Functional Materials

Automatized high pressure set-up (AHPS) is intended for complex research of the high hydrostatic pressure and temperature influence on the elastic and optical parameters of solids, liquids and viscous plastic functional materials.

Pressure in high pressure cell (HPC) is created automatically by the hydraulic press which connected with cell piston. The hydraulic block with pump and press regulates pressure value in the cell following programm personal computer commands. Variation and stabilization of temperature in HPC is performed. Volume measurement is realized by means of precision measurement of cell piston shift using interference method.

Construction of AHPS:

1. Hydraulic block
2. HPC block
3. Operation block
4. Personal computer

Measured parameters:

- Temperature
- Pressure
- Volume
- Compressibility.



Photo AHPS.

AHPS parameters

Pressure working range	from 0 to 1000 [MPa]
Temperature working range	from + 5 to + 100 [°C]
Analysed object volume	up to 5* [cm ³]
Diameter of HPC sample space	12 [mm]
Piston shift	30 [mm]
Working length of the cylindrical part of cannal	45 [mm]
Temperature registration susceptibility	0,1[°C]
Precision of the temperature registration and stabilization	± 0,5 [°C]
Pressure registration susceptibility	1 [MPa]
Precision of the pressure registration and stabilization	± 10 [MPa]

* *in case of need, HPC with larger space volume may be made.*

Transmitting medium is silicon oil.

Analysed samples are capsuled.

The measurement pressure, temperature, volume, compressibility and time are registered continuously. The data are recorded on-line in the form of graph and text file:

№	Real time, (s)	Temperature, (°C)	Pressure, (kbar)	Volume, (cm ³)	Compressibility, (kbar ⁻¹)
1	0.31	26.11	4.762	5.41965	0.08672
2	0.72	26.12	4.763	5.41918	0.03506
3	1.08	26.11	4.764	5.41899	0.02307
4	1.41	26.12	4.766	5.41874	0.02030
5	1.79	26.13	4.769	5.41841	0.01823

Additional information

HPC is produced in two modifications:

- with optical windows
- without optical windows

Any block and part of AHPS may be made separately.

Complete set AHPS the spectral device is possible.

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