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Designs



Table laboratory measuring system **with cryoconcentration** to control Helium grades «4.5» (99,995%) и «4.0» (99,99%), grade «6.0» (99,9999%), and liquid helium for presence of impurities



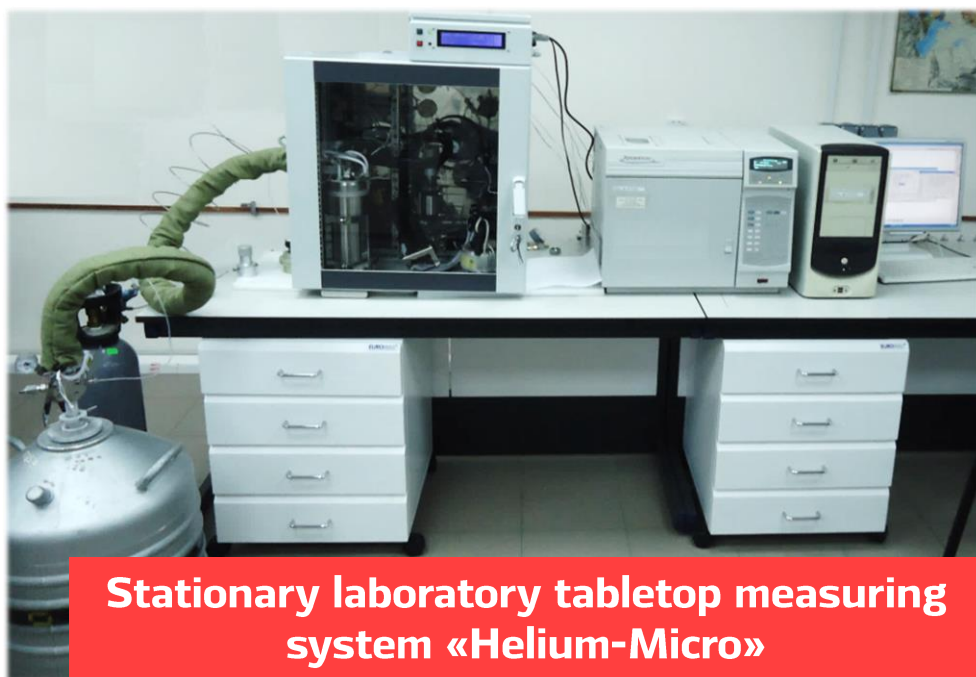
Chromatographic complex with flame ionization detector to control quality of gaseous Helium grades «4.5» and «4.0» without cryoconcentration.

**Chromatographic complex
«HELIUM-MICRO»**

Design 1

Application

Quality control of Helium grades «4.5» and «4.0», Helium grade «6.0» and liquid Helium for presence of impurities Ne, CH₄, O₂+Ar, N₂, CO, CO₂ and H₂.



Stationary laboratory tabletop measuring system «Helium-Micro»

Includes:

- ✓ Gas chromatograph with TCD, CCD (for Helium grades «4.5» and «4.0») or PED (for Helium grade 6.0);
- ✓ Automatic cryoconcentration system ACK-1;
- ✓ Liquid nitrogen feed unit;
- ✓ Personal computer.



**Cryoconcentration
system ACK-1**

Advantages:



Does not require pure gases;



Detection limit from 2 ppb (for «Helium-Micro 6.0»);



Automatic operation;



Cycle time does not exceed 13 min;



No icing on parts of cryoconcentrator;



Data collection and processing using software «Analizator» with feed of test report

Certification and test operation

- ✓ Attested measurement procedure МВИ № 1-08 and МИ № 3-16;
- ✓ Utility model patent in Russian Federation;
- ✓ Complexes are successfully operated at Orenburg Gas Processing Plant (Gazprom).



Metrological characteristics

Component	Measurement range of component volume ratio, ml ⁻¹	
	Helium grade «6.0» МВИ № 3-16	Helium grade «4.5», «4.0» МВИ № 1-08
Ne	0,10 to 0,30	5-110
H ₂	0,04 to 0,08	0,10 to 1,0 over 1,0 to 50
O ₂ +Ar	0,08 to 0,30	0,10 to 1,0 over 1,0 to 50
N ₂	0,30 to 0,70	0,10 to 1,0 over 1,0 to 50
CH ₄	0,08 to 0,15	0,20 to 1,0 over 1,0 to 50
CO	0,04 to 0,15	0,10 to 1,0 over 1,0 to 50
CO ₂	0,04 to 0,15	0,10 to 1,0 over 1,0 to 50

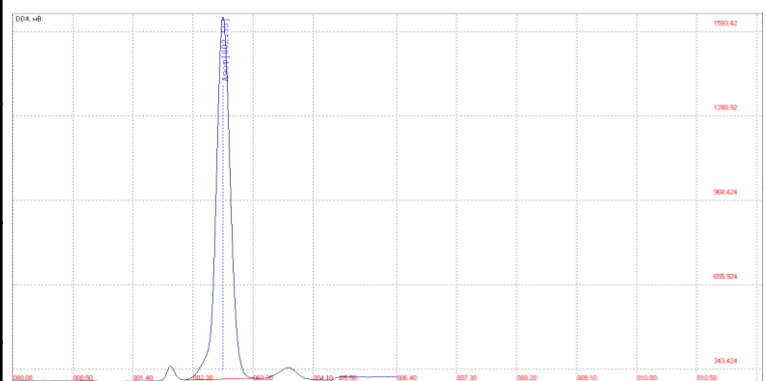
Chromatograms of Helium grade «6.0» analysis

Carrier gas: Helium grade 6.0

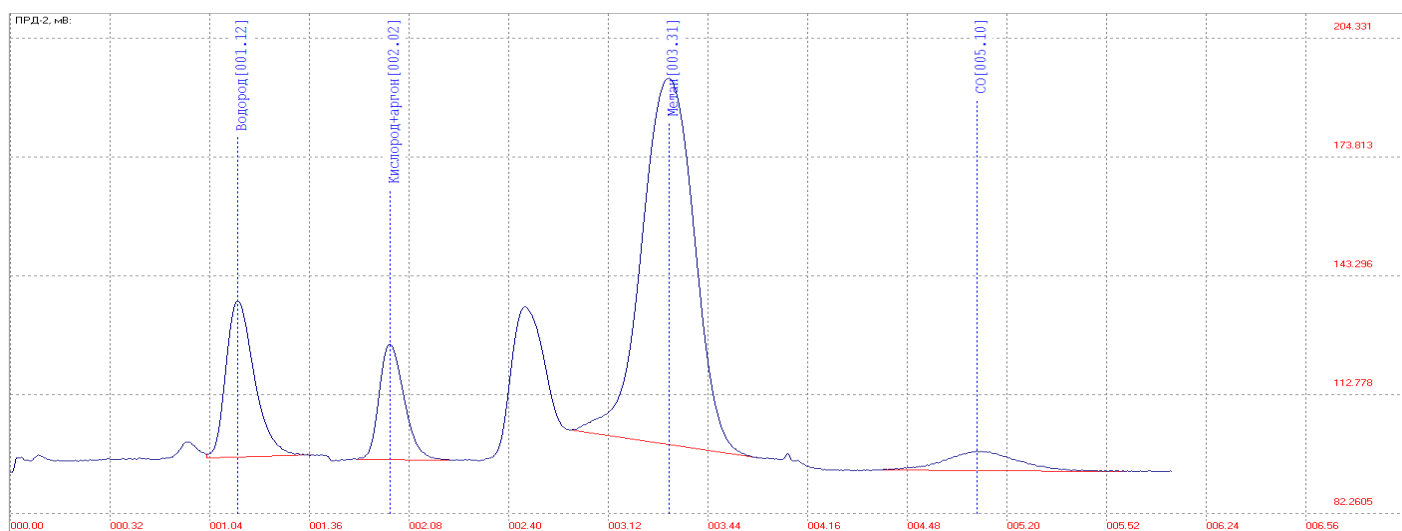
Detector: PED



Neon



N₂



H₂, O₂+Argon, CH₄, CO

Chromatographic complex «HELIUM-MICRO»

Design 2

Application

Defining impurities in Helium grades «4.5» и «4.0» at stage of rating and acceptance test of bottled Helium as well as on stream during bottles filling.

Advantages



No cryoconcentrator, no moving parts subject to wear;



No need in liquid nitrogen;



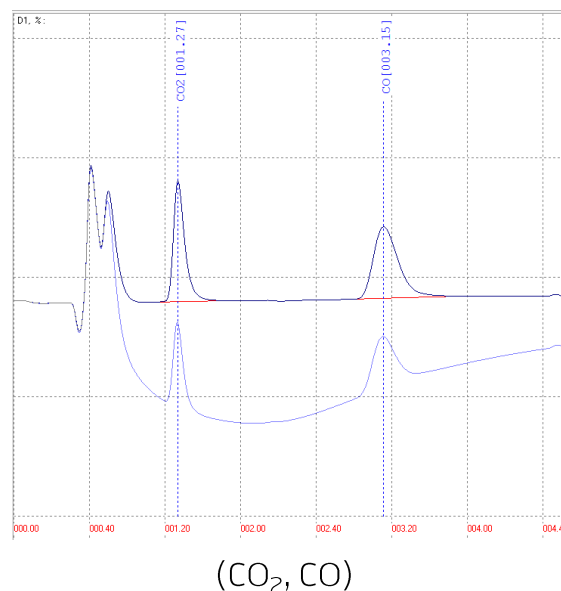
Cycle time 6 min.

Metrological characteristics

Component	Measurement range of component volume ratio, ml ⁻¹	
	Helium grade «4.5»	Helium grade «4.0»
Ne	32 to 48	72 to 108
H ₂	0,8 to 1,2	20 to 30
O ₂ +Ar	0,8 to 1,2	4,8 to 7,2
N ₂	4 to 6	16 to 24
CH ₄	0,8 to 1,2	4 to 6
CO	0,8 to 1,2	4 to 6
CO ₂	0,8 to 1,2	4 to 6

Chromatograms of Helium grade «4.5»

Carrier gas: Helium grade 6.0
Detector: PED



Questions?

Please write at kom@bacs.ru or call +7 (846) 267-38-12