

## **The underground solution mined cavern's specialty of construction and maintenance in rock salt's deposit for helium concentrate's storing**

(Poster's abstract).

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During the period of 1975-1979 on the Orenburg helium plant was constructed and in 1979 put into operation first in Russia successfully operating up to the present time underground storage of compressed helium concentrate ( content of helium about 90 vol. % ). It was developed at rock salt sediments by the solution mining method.

The technologic wells and caverns design and constructions were made with consideration increased requirements to air tightness because of great helium flowability and stored product purity that exclude possibilities of usage traditional volatile hydrocarbon liquids, namely diesel or petroleum, as liquid insoluble agent.

Also increased lifetime of underground storage caverns and it reliability were in consideration.

Six underground storage caverns with individual volume within 8000 m<sup>3</sup> to 60000 m<sup>3</sup> were constructed consequently during 1974-1979 by the solution mining method at pure rock salt's lager 1 of Kungoor time period's of Iran horizon.

Caverns depth interval was 1347-1447 m.

The caverns shaping control was implemented with usage of compressed air as insoluble agent. During construction and operation beginning the caverns successively were filled by the helium concentrate during years from 1979 up to 1991. It was implemented by means of membrane compressors of 2000 m<sup>3</sup>/h rate to maximum cavern pressure of 18 MPa. Initially the brine was withdrawn by the helium concentrate at the surplus pressure.

Successful 20 years experience confirm underground storage high effect and at the prime products quality preserve. The storage preserve small helium's concentrate leakage at much less that 0,5% of total stored helium's volume per year from all six caverns.

The cavern's volume decrease because salt convergence during operation period is about 0,5% total, i. e. insignificant.

That gives foundations to further planned of storage expansion cavern's volumes and number.