IDENTIFICATION AND SEPARATION OF GASES SUCH AS OXYGEN, HELIUM (3) AND HELIUM (4)

NTB TECHNOLOGIES LLC
EVAN KARAVOLOS, PhD
JAMES PARADISE, LMCO, RETIRED
JOHN C SMITH, PE, CSM PhD CANDIDATE
LISA BAGNAL, PhD
ANTHONY LEGGET, CONSULTANT

INTRODUCTION

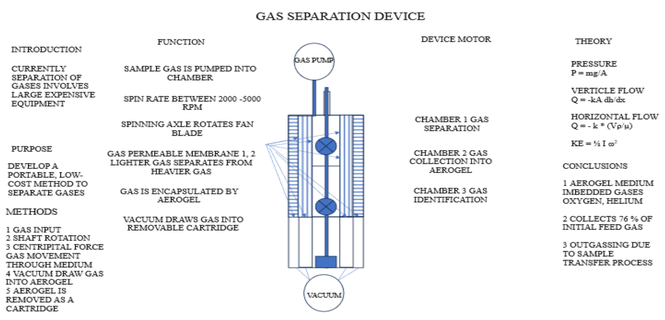
THIS EFFORT DESCRIBES A SET OF EXPERIMENTS FOR SEPARATION AND IDENTIFICATION OF VARIOUS CONSUMABLES SUCH AS OXYGEN AND HELIUM 3 AS WELL AS HELIUM 4. FOR EXAMPLE, REVENUE GAINED THROUGH HARVESTING THESE GASES HAS BEEN ESTIMATED (WORLD HEALTH ORGANIZATION 2022) TO BE BETWEEN $US200 M TO $US1.4 B

THE *PROCESS INVOLVES SEQUENTIAL HEATING AND SEPARATION* OF EACH GAS ACCORDING TO MOLECULAR WEIGHT AND SPIN ORIENTATION.

PURPOSE

THIS RESEARCH EFFORT IDENTIFIES THE GASES OXYGEN, HYDROGEN, HELIUM 3 AND HELIUM 4.

EXAMPLE NMR INSTRUMENT



INSTRUMENT SCHEMATIC

PROTO MODEL

METHODS

1 OPEN I INPORT VALVE TO CHAMBER 1

2 IMPORT GAS AND DUST FROM SOURCE INTO CHAMBER 1

3 CLOSE CHAMBER VALVE 1

4 TURN ON MAGNETIC SOLENCOID OF CHAMBER 2

5 ALLOW UP TO 120 SECONDS (EST) FOR GAS TO SEPARATE ACCORING TO MAGNETIC SUSCEPTIBILIY (HELIUM 4 NO CHARGE MIGRATE TO TOP, HELIUM 4, NO CHARGE AND HEAVIER, MIGRATE TO BOTTOM).

6 OPEN VACUUM PORT OF CHAMBER 3

7 ALLOW GASES TO ACCUMULATE IN ADSORBANT MATERIAL (FOR EACH GAS). HELIUM 3 WILL BE STATISTICALLY LOCATED AT TOP, HELIUM 4 WILL BE STATISTICALLY AT BOTTOM. (SOME MIXING WILL OCCUR)

8 CLOSE VALVE CHAMBER 3

RESULTS

SAMPLE GROUP	MEAN FIVE SAMPLES	STANDARD DEVIATION	STANDARD ERROR
1	1000.435	1.18	1.18/2.236 = 0.236
2	999.44	1.91	1.91/2.236 = 0.854

SAMPLE	DRILL ROTATION TIME RPM	DRILL RPM	GAS COLLECTION MOLES	TOTAL MOLES
1	120	4500	71.3	100
3	120	4590	72.6	101.5

CONCLUSIONS

1. STANDARD DEVIATION RANGE 0.42 TO 1.35
2. STANDARD ERROR RANGE BETWEEN +/- 0.22 – 0.44
3. PERCENTAGE OF HE 3 GAS TO HE 4 GAS 10.2 PPT
4. NUMBER OF FALSE POSITIVES 3/10 TESTS
5. NUMBER OF FALSE NEGATIVES 1/10 TESTS

REFERENCES

[1] A.LEGGETT, COMMUNICATION 2025
[2] WORLD HEALTH ORGANIZATION 2022