

Lab 1 - Thermodynamics

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1 Gas Experiment

1.1 Co₂

Resonance Frequencies

Length:

1. 118.1 ± 0.1 kOhm, 225.170 ± 0.2
2. 117.5 ± 0.1 kOhm, 328.890 ± 0.2
3. 117.3 ± 0.1 kOhm, 441.680 ± 0.2
4. 117.1 ± 0.1 kOhm, 544.400 ± 0.2
5. 116.9 ± 0.1 kOhm, 652.390 ± 0.2
6. 116.9 ± 0.1 kOhm, 760.960 ± 0.2
7. 116.5 ± 0.1 kOhm, 869.760 ± 0.3
8. 116.3 ± 0.1 kOhm, 977.600 ± 0.3
9. 116.2 ± 0.1 kOhm, 1089.300 ± 0.3
10. 116.1 ± 0.1 kOhm, 1196.200 ± 0.4
11. 116.0 ± 0.1 kOhm, 1304.4 ± 0.4
12. 115.8 ± 0.1 kOhm, 1957.3 ± 0.5

1.2 Air at 50°C

Resonance Frequencies Length: 1244 ± 1.5 mm

1. 47.9 ± 0.1 kOhm, 309.0 ± 0.3
2. 47.6 ± 0.1 kOhm, 444.9 ± 0.3
3. 47.4 ± 0.1 kOhm, 587.5 ± 0.3
4. 47.1 ± 0.1 kOhm, 731.1 ± 0.3
5. 46.9 ± 0.1 kOhm, 875.5 ± 0.4
6. 46.7 ± 0.1 kOhm, 1020.1 ± 0.5
7. 46.5 ± 0.1 kOhm, 1165.2 ± 0.5
8. 46.3 ± 0.1 kOhm, 1311.0 ± 0.5
9. 46.1 ± 0.1 kOhm, 1455.4 ± 0.5

10. $45.6 \pm 0.1 \text{ kOhm}$, 1601.5 ± 0.5
11. $45.4 \pm 0.1 \text{ kOhm}$, 1746.8 ± 0.5
12. $45.3 \pm 0.1 \text{ kOhm}$, 1892.8 ± 0.5

1.3 Air at Room Temperature

Resonance Frequencies Length $1243 \pm 1.5 \text{ mm}$

1. $112.8 \pm 0.1 \text{ kOhm}$, 285.5 ± 0.2
2. $112.8 \pm 0.1 \text{ kOhm}$, 417.8 ± 0.2
3. $112.7 \pm 0.1 \text{ kOhm}$, 471.3 ± 0.2
4. $112.8 \pm 0.1 \text{ kOhm}$, 561.2 ± 0.3
5. $112.8 \pm 0.1 \text{ kOhm}$, 698.4 ± 0.3
6. $112.8 \pm 0.1 \text{ kOhm}$, 863.6 ± 0.3
7. $112.7 \pm 0.1 \text{ kOhm}$, 975.5 ± 0.3
8. $112.6 \pm 0.1 \text{ kOhm}$, 1114.0 ± 0.3
9. $112.6 \pm 0.1 \text{ kOhm}$, 1253.0 ± 0.4
10. $112.6 \pm 0.1 \text{ kOhm}$, 1392.3 ± 0.4
11. $112.5 \pm 0.1 \text{ kOhm}$, 1531.3 ± 0.4
12. $112.7 \pm 0.1 \text{ kOhm}$, 1670.9 ± 0.5
13. $112.8 \pm 0.1 \text{ kOhm}$, 1809.1 ± 0.5
14. $112.6 \pm 0.1 \text{ kOhm}$, 1948.8 ± 0.5

1.4 Air at 70°C

Resonance Frequencies Length $1244 \pm 1.5 \text{ mm}$

1. $16.2 \pm 0.1 \text{ kOhm}$, 301.3 ± 0.2
2. $16.3 \pm 0.1 \text{ kOhm}$, 369.0 ± 0.2
3. $16.5 \pm 0.1 \text{ kOhm}$, 459.1 ± 0.2
4. $16.6 \pm 0.1 \text{ kOhm}$, 607.4 ± 0.2
5. $16.6 \pm 0.1 \text{ kOhm}$, 757.2 ± 0.3

6. $16.7 \pm 0.1 \text{ kOhm}$, 907.2 ± 0.3
7. $16.7 \pm 0.1 \text{ kOhm}$, 1057.9 ± 0.3
8. $16.7 \pm 0.1 \text{ kOhm}$, 1209.5 ± 0.3
9. $16.8 \pm 0.1 \text{ kOhm}$, 1360.6 ± 0.4
10. $16.8 \pm 0.1 \text{ kOhm}$, 1511.8 ± 0.4
11. $16.8 \pm 0.1 \text{ kOhm}$, 1662.5 ± 0.4
12. $16.9 \pm 0.1 \text{ kOhm}$, 1813.8 ± 0.4
13. $16.9 \pm 0.1 \text{ kOhm}$, 1965.8 ± 0.5