

## Adiabatic coefficient of gases - Flammersfeld oscillator

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### Principle

A mass oscillates on a volume of gas in a precision glass tube. The oscillations are maintained by leading escaping gas back into the system. The adiabatic coefficient of various gases is determined from the periodic time of the oscillation.

### Benefits

- Suitable for many different gases
- Compact, easily transportable setup

### Tasks

Determine the adiabatic coefficient of air, nitrogen and carbon dioxide from the periodic time of the oscillation  $T$  of the mass  $m$  on the volume  $V$  of gas.

### Learning objectives

- Equation of adiabatic change of state
- Polytropic equation
- Rüchardt's experiment
- Thermal capacity of gases

## Scope of delivery

Gas oscillator, Flammersfeld	04368-00	1
Graduated cylinder, Borosilicate, 1000 ml	36632-00	1
Aspirator bottle, clear gl. 1000ml	34175-00	1
Air control valve	37003-00	1
Cobra SMARTsense Dual Photogate - Double light barrier 0 ... ∞ s (Bluetooth + USB)	12945-00	1
Micrometer screw gauge 0 - 25 mm	03012-00	1
Glass tube, right-angled, .	MAU-10030703	1
Rubber stopper, d = 22/17 mm, 1 hole	39255-01	1
Rubber stopper 26/32, 1 hole 7 mm	39258-01	1
Rubber hose	39282-00	2
Balance OHAUS LG 311, 4 beams, 0...311 g	44007-31	1
Aquarium pump, 150 l/h, 230 V AC	64566-93	1
Precision barometer, d=100mm	87998-00	1
Digital stopwatch, 24 h, 1/100 s and 1 s	24025-00	1
Tripod base PHYWE	02002-55	1
Support rod, stainless steel, different lengths	02032-00	1
Right angle clamp expert with fulcrum screw	02054-00	2
Universal clamp	37715-01	1
Reducing valve for CO2 / He	33481-00	1
Reducing valve f. nitrogen	33483-00	1
Steel cylinder, CO2, 10l, full	41761-00	1
Steel cylinder, nitrogen, 10l, full	41763-00	1
Tubing adaptor, ID 3-5/6-10 mm	47517-01	1
Rubber hose	39279-00	1