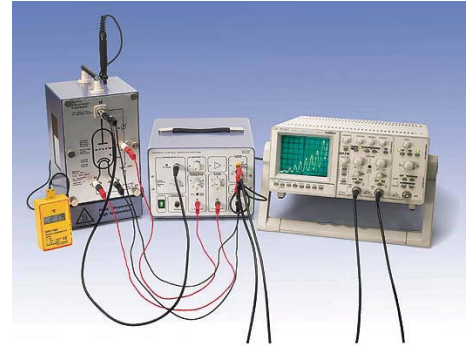


UA-04 Frank-Hertz experiment

In 1913 Franck and Hertz first performed the important experiment demonstrating discrete energy states in atoms. This experiment demonstrating the quantization of energy as well as the recording and evaluation of spectra is included in most of the curricula used around the world.

This experiment can be performed with the Franck-Hertz tubes described below. There are two tubes available, Mercury filled tube (which requires a heater) and Neon filled tube (option). Both tubes require the specially designed power supply shown as well as an oscilloscope. We have packaged the required items in convenient systems, however, replacement tubes are available separately. Additionally if you want to purchase both the Ne and Hg tube only one of the special power supplies is required.



Franck-Hertz Tube with Mercury and Oven

Free electrons colliding with mercury atoms emit energy in quantized packets. The excitation energy at 4.9 eV can be determined. A highly-evacuated cathode ray tube with mercury gas filling and plane-parallel electrodes in order to avoid distortion of the field lines. Electrodes include an indirectly heated, oxide cathode, perforated to produce a homogenous electric field plus an anode grid and collector (counter) electrode. In order to raise the probability of collisions between electrons and mercury atoms to a sufficient amount, the tube needs to be heated using a special heater. This heater is used for adjusting the vapor pressure in the mercury filled tube. It is a spray painted metal housing with the tube symbols printed on the front panel that are visible from a distance, ceramically insulated connection sockets, viewing windows, opening with spring clamp for thermometer in the lid, insulated carrying handle and built-in thermostat for adjusting temperature.



This system includes the

- Franck-Hertz tube with mercury filling and Heater,
- Power Supply Unit.
- Options:
- A dual beam analog oscilloscope
- Data acquisition system USB model