



Greenhouse effect (C5.3.2.1)



C5.3.2 GLOBAL ENVIRONMENTAL PROBLEMS

C5.3.2.1 Greenhouse effect

Cat. No.	Description	C5.3.2.1
666 2652	IR gas experiment kit	1
524 005W	Mobile-CASSY 2 WiFi	1
524 220	CASSY Lab 2	1
524 0401	μ V sensor S	1
521 536	DC Power Supply 2 x 0...16 V/2 x 0...5 A	1
501 45	Connecting lead 19 A, 50 cm, red/blue, pair	2
501 861	Crocodile-clips, polished, set of 6	1
557 36	Moll's thermopile	1
375 58	Hand vacuum pump	1
604 500	PVC tubing 6 mm Ø, 1 m	1
604 431	Silicone tubing, 5 mm diam., 1 m	1
667 197	Silicone tubing, 4 mm diam., 1 m	1
604 520	Connector with nipple	1
661 0010	Minican pressurised gas canister, argon	1
660 988	Minican pressurised gas canister, ethane	1
661 0011	Minican pressurised gas canister, isobutane	1
660 999	Minican pressurised gas canister, carbon dioxide	1
660 998	Minican pressurised gas canister, oxygen	1
660 980	Fine regulating valve for minican gas canisters	1
additionally required: PC with Windows 7 or higher with WiFi or USB connection		1

The Earth's climate is determined by a complex interaction of numerous factors. Many of those factors mutually affect and strengthen one another. As a result, the climate is subject to constant fluctuations on all time scales, from decades to millions of years. Today humans are intervening in this self-regulating system to a massive extent.

In experiment C5.3.2.1, the IR- CO_2 experimentation kit is used to demonstrate the absorption of infrared (IR) radiation by CO_2 in the wavelength range from 4100 to 4300 nm. The short-wave radiation of the Sun penetrates water vapour, carbon dioxide, ozone, nitrous oxide and methane in the Earth's atmosphere and reaches the surface of the Earth unimpeded. The long-wave heat radiation is absorbed. Acting like the glass of a greenhouse, the greenhouse gases impede the release of energy from the Earth and cause heat to build up. Only a small part of the heat radiation is emitted directly into space – the far greater share is reflected back toward the surface of the Earth. This is referred to as the natural greenhouse effect. The proportion of greenhouse gases is changing as a result of human activity. The associated temperature increase is referred to as the anthropogenic greenhouse effect.