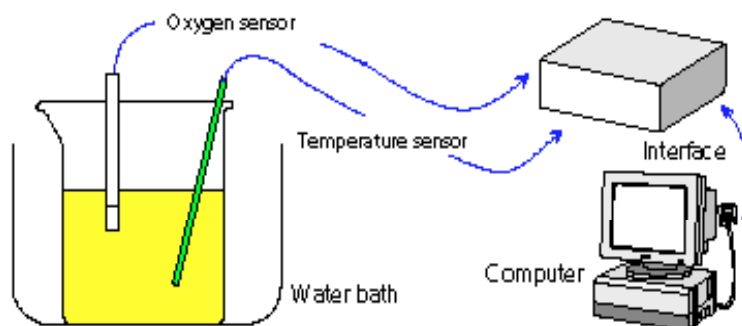


Oxygen solubility and temperature



As the temperature of water increases, the solubility of oxygen decreases. This is significant in pollution studies - for example, when factory outflow warms a river. In this experiment a sample of aerated water is warmed as the oxygen level and temperature are monitored by sensors. The software can plot the oxygen level against the temperature. The response of the oxygen probe is itself affected by temperature so a thermistor compensates for this.

Apparatus

Water, aquarium pump to aerate the water, beaker, water bath, stirrer/heater, interface, oxygen probe / oxygen sensor, temperature sensor.

Setting up

Aerate the water with the pump. Let the oxygen sensor stabilise for around 15 minutes before use.

Connect the oxygen sensor to socket 1 on the interface. Connect the temperature sensor to socket 2 on the interface.

Some systems recognize the sensors you attach automatically, in others you do this yourself. If the temperature sensor has a range control, set this to a suitable range eg to measure up to 40 degrees. You may be able to calibrate the oxygen sensor to read 21% oxygen in room air.

Recording the data

Switch on the heater. Don't let the temperature exceed 65°C.

Record for 20 minutes.

Using the results

What does the graph tell you about the change in temperature during the experiment?

What does the graph tell you about the change in oxygen level during the experiment?

Why does the oxygen level change?

How do the graphs change with respect to each other? Is there a pattern here and what does it tell you about the solubility of oxygen at different temperatures?

With a graph on the screen, get the software to plot temperature on the horizontal axis and plot the oxygen level on the vertical axis.

Save your data on disk. Print the graph.

