

## Measurements of the stable isotopes $^{13}\text{C}$ and $^{18}\text{O}$ in atmospheric CO at IMAU, Utrecht University (NL)

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A fully automated system for the determination of  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  in atmospheric CO has been developed at IMAU, using continuous flow isotope ratio mass spectrometry (CF-IRMS). First, the  $\text{CO}_2$  present in the air sample is removed completely, using Ascarite /  $\text{Mg}(\text{ClO}_4)_2$  followed by a cryogenic trap. The CO is then converted to  $\text{CO}_2$  using Schütze reagent, and it is analyzed as  $\text{CO}_2$  in an isotope ratio mass spectrometer (IRMS).

The system is able to perform measurements at typical atmospheric mole fractions and below, relatively fast (20 min / analysis), and needs small quantities of sample air (150 ml / analysis). It can thus be used for atmospheric samples, but also for e.g. ice core, stratospheric, soil air and other normal or low CO mole fraction samples. At normal atmospheric CO mole fractions, the typical repeatability is 0.1 ‰ for  $\delta^{13}\text{C}$  and 0.2 ‰ for  $\delta^{18}\text{O}$ . The lower limit for the CO mole fraction in air that can be analyzed is currently about 30 ppb.

We will present an overview of the system setup and the main quality check means, and will give some examples of data from measurements performed so far.