



## **d13C determination of atmospheric methane: constrains related to 17O-correction used for the CO2 mass-spectrometry**

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Two areas of  $^{13}\text{C}$  determinations are most critical: isotope monitoring on  $\text{CO}_2$  and methane. Data compatibility is very important for the monitoring. The  $\text{d}^{13}\text{C}$  monitoring of  $\text{CO}_2$  is rather well established and numerous inter-comparisons are focused on data compatibility. The monitoring of methane  $\text{d}^{13}\text{C}$  is rapidly developing and many aspects have not been considered yet. For the  $^{17}\text{O}$ -correction one has to describe  $\text{CO}_2$  in question relative to the isotope scale in use. It is important to consider the  $^{17}\text{O}$ -variations in all the materials involved, such as primary and secondary isotope standards as well as  $\text{O}_2$  gas used for methane combustion. Furthermore a consistent use of the  $^{17}\text{O}$ -correction algorithm is critical. In case of inconsistent combination of different  $^{17}\text{O}$ -correction algorithms a bias in  $\text{d}^{13}\text{C}(\text{CH}_4)$  of about 0.2 permille arises. Its magnitude may be modified due to the actual  $\text{d}^{18}\text{O}$  value of the oxygen involved. This bias is larger than analytical uncertainty of 0.05 permille reached in the best laboratories and is comparable to the amplitude of  $\text{d}^{13}\text{C}(\text{CH}_4)$  seasonal cycle. These two aspects and problems to be solved will be discussed.