

Odor measurements at a biological waste plant

The analysis of the odors at the biological waste plant was performed using two different sampling techniques:

1.) The air at the site and the emissions of two different reactors was analyzed directly with the electronic nose by pumping the air through the sensor array system. The signal of the sensor array is displayed in fig.1.

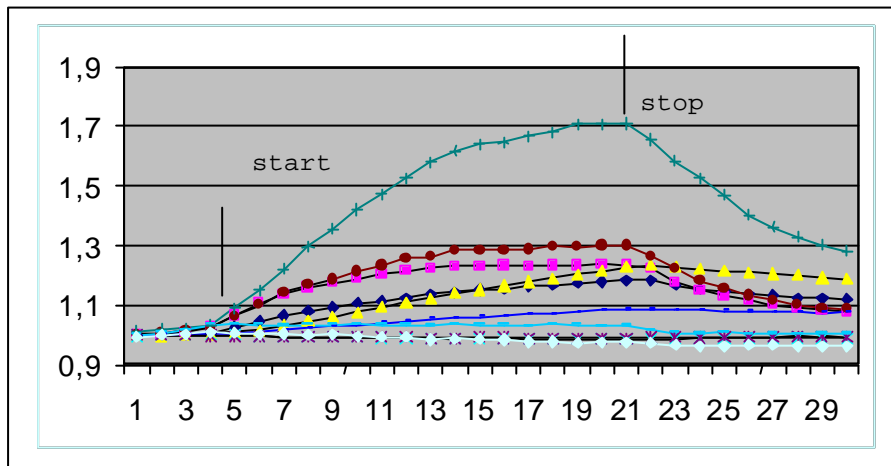
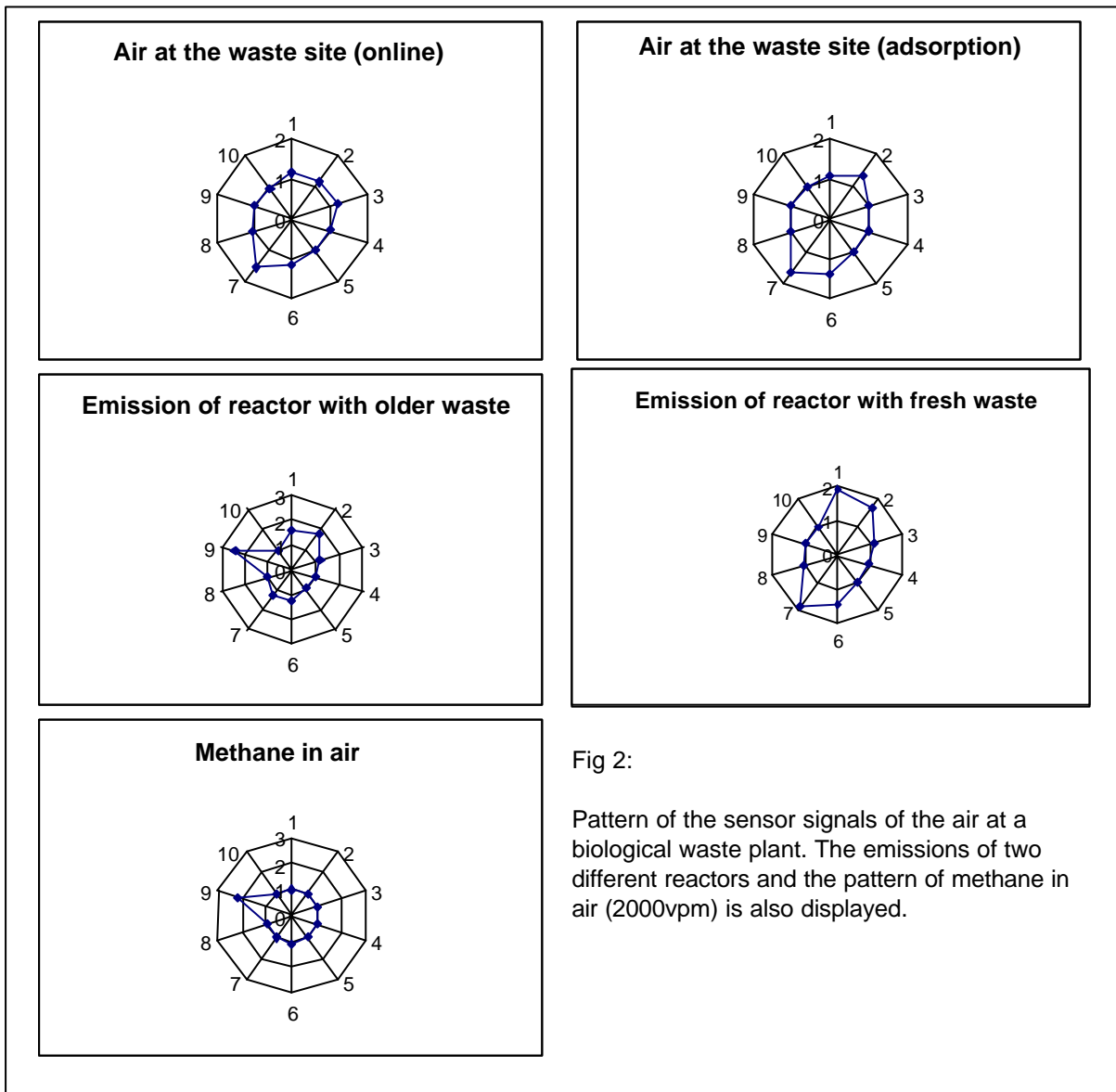


Fig. 1: Signal of the sensors after exposing them to the air at a biological waste site.

2.) The air at the site was sampled on an adsorption tube. After sampling 1 L the tube was thermally desorbed and the released organic compounds were analyzed with the electronic nose.

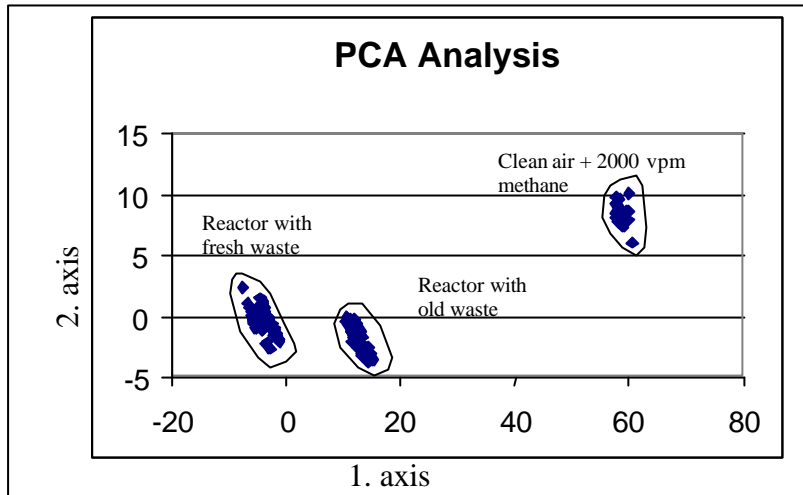
A comparison between the two methods shows that a lower detection limit can be achieved with the adsorption tube. There is a different pattern of the sensor signals, mainly due to the fact, that high volatile compounds like methane, are not adsorbed on the adsorption tube.

The pattern of the sensor signals is displayed in fig. 2. It is clearly shown, that also different conditions of the waste can be recognized. In the older waste-reactor we could also measure methane (see sensor 9).



A PCA-Analysis (Principal-Components-Analysis) can be used to show how good the different pattern can be recognized. The corresponding PCA-Analysis of the emissions of the reactors is displayed in fig. 3. It is shown, that for consecutive measurements (6 times) the differentiation of the emissions is very good, because there is no overlapping of the regions.

Fig. 3: PCA-Analysis of the reactor emissions and of methane.



The results show, that biological waste plants can be monitored by using our sensor array system. The adsorption on special sampling tubes can be also very useful, especially to lower the detection limits.