



AquaFit4use

Chemometric methods as useful tool for characterization of different environmental samples

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DESCRIPTION AND SPECIAL FEATURES

Chemometrics is a scientific discipline closely connected with statistics and mathematics. It has an important role in analytical chemistry. Modern analytical methods provide opportunity to collect large amounts of data for various samples. For handling analytical results different chemometric methods are employed, such as basic statistical methods for the determination of mean and median values, standard deviations, minimal and maximal values of measured parameters and their mutual correlation coefficients, the *principal component analysis* (PCA), *cluster analysis* (CA), and *linear discriminant analysis* (LDA). The objectives of chemometrics are focused on characterization and chemometrical classification of different samples. The quality of environmental samples such as water, sediment, soil, air samples etc. can be determined according to measured physical and chemical parameters, which represent the individual samples. Chemometric methods give information regarding measured parameters about similarity between sampling locations, sources of pollution, seasonal behavior and time trends. Monitoring of general pollution of environmental samples and following measuring parameters which are above permitted level given by legislation can be used for searching of pollution source and for planning prevention measures from pollution. Using PCA clusters of samples are well defined (Figs.1,2)

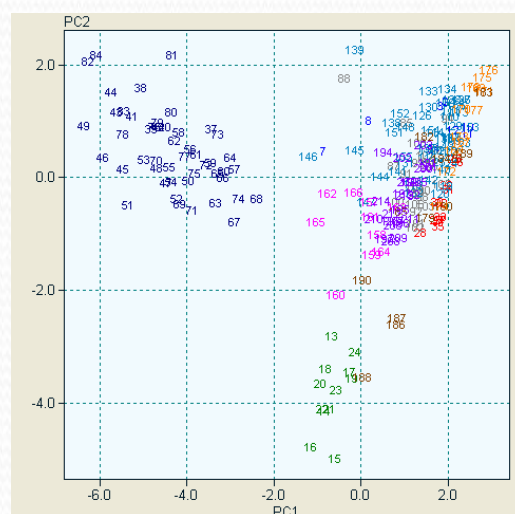


Figure 2.-PCA for 214 water samples from 10 different sampling sites; each sample is enumerated (1-214) and classes are associated with different colors.

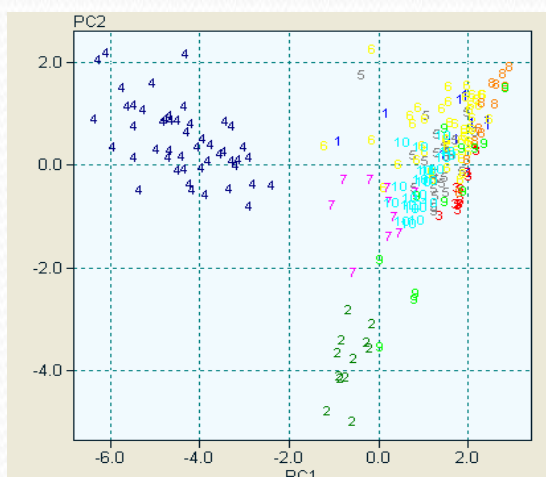


Figure 1:Principal Component analysis (PCA) for 214 water samples from 10 different sampling sites denoted by class numbers from 1 to 10.

INNOVATIVE ASPECTS

The determination of different classes of water streams regarding different pollution parameters measured for textile waste water samples is innovative according to **chemometric methods used**.

COMPETITIVE ADVANTAGES

The study gives the opportunity to follow the quality of water samples. The aim is to find a reliable and a quick method for classification of textile waste water streams from different processes and outlets of the same process and to choose the best solution for reuse of textile waste waters. Chemometric methods helped us to find correlation between different textile waste water streams and enabled the classification of textile waste water effluents; thus can be used for separation of streams into treatable and non treatable ones by selected technologies.



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knowledge transfer and dissemination

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DISSEMINATION AND training