

Supplementary information - Principal Component Analysis (PCA) by PASW Statistics software

In order to show clearly the relation between the TOC migration and chlorine consumption in this research, a principal component analysis for the present data was carried out using PASW Statistics (formerly SPSS Statistics) software from IBM Company. TOC concentration and chlorine consumption were set as two numerical variables in PASW statistics.

The original data for PCA analysis is shown in Table 1. From the factor descriptive analysis, it is noticed that TOC concentrations were correlated with chlorine consumption with a coefficient of 0.867 (see Table 2), suggesting that TOC and chlorine consumption have a close relationship. Moreover, during the extraction and rotation processes of principal component analysis, component 1 with a cumulative contribution of 93.3% contains the main loading of TOC and chlorine consumption (details see supplementary Fig.1 and Fig.2). According to the PASW statistics, it is concluded that TOC migration from the tested pipes were positively correlated with the corresponding chlorine consumption. This also implied that the reduction in the chlorine concentrations before and after migration tests for each type pipe material was attributed to the chemical reaction between chlorine and organic contaminants leached from polymer pipes.

Table 1 Original data for principal component analysis.

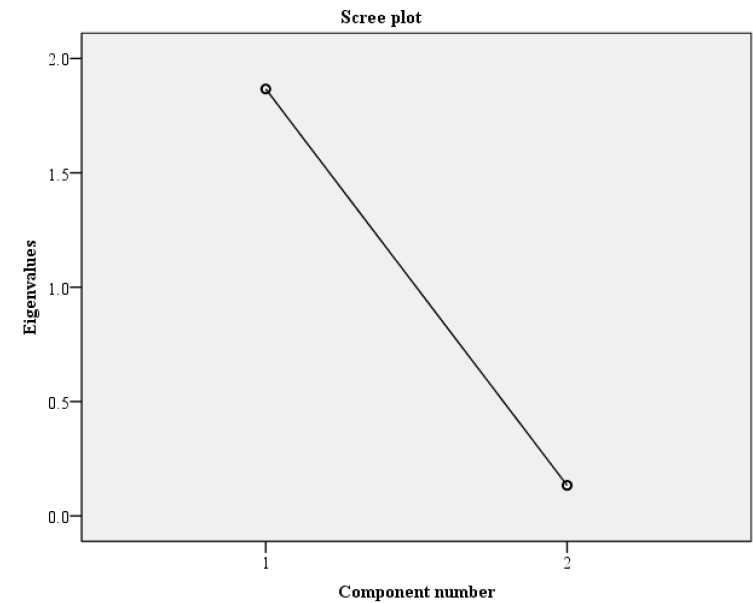
Materials	TOC concentration	Chlorine consumption
uPVC	0.0092	0.4333
uPVC	0.0078	0.1333
uPVC	0.0198	0.1333
uPVC	0.0106	0.1333
uPVC	0.0223	0.0333

uPVC	0.0209	0.1333
uPVC	0.0205	0.3667
uPVC	0.065	0.6
uPVC	0.1151	1.0667
uPVC	0.1791	1.35
PPR	0.067	0.5667
PPR	0.006	0.1667
PPR	0.0268	0.2
PPR	0.0015	0.1
PPR	0.0152	0.0333
PPR	0.0196	0.1
PPR	0.0759	0.7333
PPR	0.0768	0.8667
PPR	0.1594	1.4
PPR	0.1981	1.54
PE	0.1902	0.9
PE	0.0352	0.5
PE	0.0619	0.3
PE	0.0436	0.4
PE	0.0762	0.4
PE	0.0421	0.2
PE	0.0342	0.2

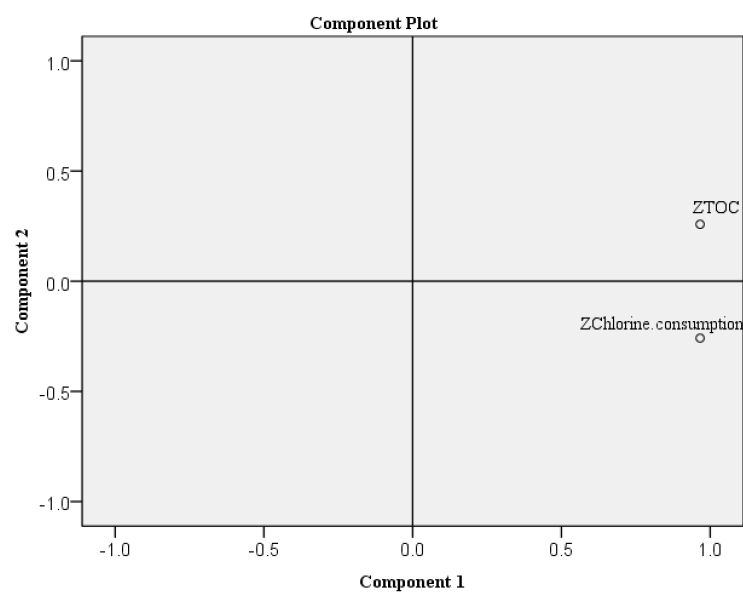
PE	0.3431	1.2
PE	0.3738	1.5
PE	0.4822	1.7767
PE	0.6968	1.89

Table 2 Correlation matrix of water quality indicators

Indicators	Chlorine consumption	TOC
Chlorine consumption	1.000	0.867
TOC	0.867	1.000



Supplementary Fig.1 - Scree plot after extraction of principal components, indicating component 1 could explain the data of TOC and chlorine consumption.



Supplementary Fig.2 - Component loading plot for PCA, indicating component 1 contains the main loading of TOC and chlorine consumption.