

Crumb rubber toxicity in coastal marine systems

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The crumb rubber problem



In Norway, ~3 tonnes of crumb rubber are lost from soccer fields every year, in addition to tire wear from driving, and emissions from end-of-life car tire processing plants located near the sea → $\geq 2000 \text{ t year}^{-1}$

Chemical analysis

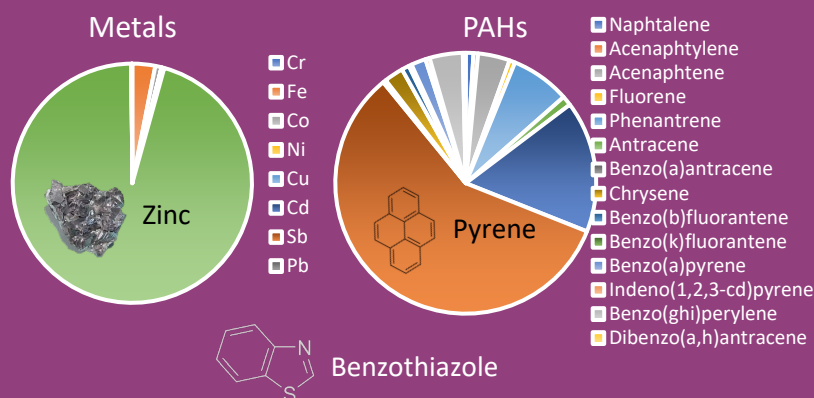
Crumb rubber granulates and a range of concentrations of seawater leachates were analysed with a combination of

- conventional gas- and liquid chromatography mass spectrometry (GC-MS and LC-MS)
- pyrolysis gas chromatography MS (py-GC-MS)
- inductively coupled plasma MS (ICP-MS)

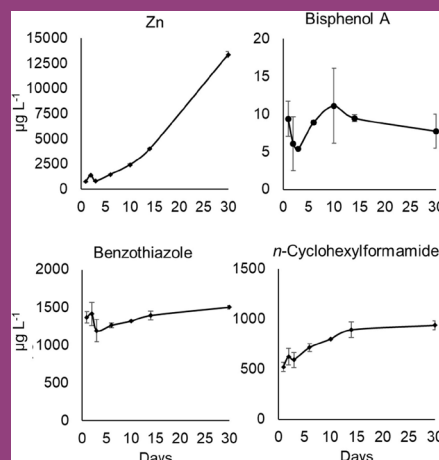


Acknowledgement: This work was funded by the Fram Centre flagship 'Hazardous substances – effects on ecosystems and human health', Project 1002018

Chemical composition of crumb rubber



Leaching into seawater



After 14 days, a distinct grey coloration of the seawater was visible, and a number of metal and organic additives had leached.

Benzothiazole and Zn were the additives with highest concentrations in leachates, while PAH concentrations remained lower than those in the corresponding rubber granulate.



Ingestion of crumb rubber



Leachate toxicity

