

RESEARCH ON TOXIC FUMES WHICH SEAFARERS ON BOARD TANKERS ARE EXPOSED TO DURING NORMAL (WORKING) OPERATIONS

Jacobs Werner¹, Dirk Dubois¹, Diane Aerts¹, P. Declerck¹, René Van Grieken², Marianne Stranger², L. Flavia Ana Godoi³ and A. Buczyńska³

¹ Hogere Zeevaartschool Antwerpen
Noordkasteel Oost 6, 2018 Antwerpen, Belgium
E-mail : werner.jacobs@hzs.be

² Universiteit Antwerpen
Campus Drie Eiken, D.B 207, Universiteitsplein 1, 2610 Wilrijk, Belgium

³ UNICENP
Rua Prof. Pedro Viriato Parigot de Souza, 5300 Campo Comprido, Curitiba – PR,
CEP 81280-330, Brazil

Setting

During normal management of a tanker, the crew will perform operations in the cargo part of the vessel, like entering tanks, cleaning lines, connecting and disconnecting of the manifold, sampling and maintenance of specific equipment. Under these circumstances there will be a higher risk of direct contact with the cargo. No data are available concerning vapor concentrations. Neither are these data available for the atmosphere in the engine room and inside accommodations.

Aim

The objective of the study is double. On one hand this study aimed to assess the presence of toxic vapors in the accommodation and the engine room on board of tankers, in order to establish the exposure of the crew. A new, precise and selective sampling system was used. Radiello passive samplers offer several advantages for this application, including no electricity use, small sizes, adjustable exposure times and especially a precise and selective measurement of air concentrations.

In this study, a wide variety of volatile organic compounds has been sampled applying an adsorbing cartridge filled with activated charcoal (radiello code 130). Sample preparation was done by chemical desorption of the analytes using carbondisulfide (CS₂). The analysis of the analytes was performed using gas chromatography coupled to mass spectrometry.

On the other hand we measured the concentrations of toxic vapors over relative short periods, during well specific operations on deck. Here the concentrations were measured with the 'PAC III' apparatus of Draeger. The results of this investigation should allow the optimization of the correct use of respiratory protection aids during the above-mentioned operations.