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ANALYSIS OF PAH, CHROMIUM AND NICKEL IN TATTOO INKS**Gerd Mildau¹**¹*CVUA Karlsruhe; (Karlsruhe, Germany).*

As official laboratory for competent authorities in Germany CVUA Karlsruhe analyses yearly risk orientated random samples of tattoo inks to ensure that they comply with the recommendations of the Resolution ResAP(2008)1 of the European Council. In 2012 and 2013 the surveillance program focused on the analysis of black tattoo inks in terms of carcinogenic Polycyclic Aromatic Hydrocarbons (PAH) and of colored tattoo inks in terms of nickel and chromium VI as strong sensitizers.

Pigment for black tattoo inks is Carbon Black as a material produced by the incomplete combustion of heavy petroleum products. Carbon black is considered possibly carcinogenic to humans and classified as a Group 2B carcinogen because of its content of impurities of PAH. Classification differs EPA-PAH and EFSA-PAH. With our method we analyze 21 substances by GC-MS. Sample preparation is done with ultrasonic bath and toluene as solvent. The determination of traces of nickel and total chromium (chromium III and chromium VI) is carried out via AAS after microwave-digestion at 200 degrees Celsius. If total chromium is above 5 ppm there is a specific determination of chromium VI by spectrophotometry after extraction in neutral milieu and derivatization with diphenylcarbazide to a diphenylcarbazon-complex.

In 2012/2013 two tattoo-inks contained Nickel in 12 mg/kg and 45 mg/kg. Those high concentrations were judged as serious risk cases. ResAP(2008)1 doesn't constitute limit values for nickel but Nickel should be "as low as technically achievable". In 2013 totally 36 samples were analyzed. Whereas four samples had amounts of 1-1.5 mg/kg, in most samples (32) nickel was below LoD (0.5 ppm). As a consequence 0.5 ppm may be considered as low as technically achievable.

Total-Chromium (Chromium III and Chromium VI) were analyzed in six samples in concentrations of 1.5 to 2 mg/kg. Most samples had amounts below LoD of 0.5 ppm Chromium.

The situation of PAH in black tattoo inks is more difficult. 8 of 35 samples were judged as serious risk cases to be published in RAPEX (i.e. amounts of Benzo-a-Pyrene (BaP) with 1500/1150/900/500 or 200 ppb).