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Commentary

Furan Identification in Food by using HS-SPME Method

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DESCRIPTION

Furan and its derivatives are natural compounds that are formed naturally and found in many processed foods and beverages. These connections are low order thresholds and contribute significantly to sensory characteristic heated food or drinks. Recently, the presence of furan in food has received a lot of attention from several international food organizations such as the US FDA and European Food Safety Authorities (EFSA). Furans have been found to be carcinogenic and carcinogenic in nature and cause cytotoxic effects on both humans and animals which may cause adverse effects on human health. Under these circumstances, the US Food and Drug Administration and soon after the European Food Safety Authority began to take further steps on researching on furan in food products by gather information on analytical methods, occurrence, and morphology.

Furan has been identified in coffee, baby food, sauces, and soups in association with food, ingestion exposure, and furan toxicity. Due to this growing interest, more and more selective and sensitive analytical methods have been developed and applied in recent years.

Analysis of furan in food by using HS-SPME method linked with GC-MS

Headspace Solid-Phase Micro Extraction (HS-SPME) method: For the extraction of furans and furan derivatives, Headspace Solid-Phase Micro Extraction (HS-SPME) method was applied under fine-tuning in extraction conditions. Specifically in 40 ml of vial accurately weigh each pre-chilled sample of 10 gms After that weigh 10 ml saturated aqueous NaCl solution in 40 ml of vial and inert the valves. Insert the fiber without penetrating the septum of polydimethylsiloxane fire with a thickness of 50 or 30 μm and stored in manual holder. Samples were equilibrated for 15 minutes before extraction of 15 minutes. The sample was continuously stirred during the extraction. Split less of fiber after sampling hold GC-MS injector at 260°C for 3 minutes. For thermal desorption of analytes on to capillary GC columns. Number of artifacts observed after his SPME analysis and saturated saline solution will run as blank.

By testing several parameters CAR/PDMS fibers and explored the effects of several variables, including sample/saline ratio, extraction time and temperature, desorption time and extraction efficiency. The main criteria used to measure the efficiency were desorption peak area (total ion chromatogram) and the coefficient of variation of the measurements.

CONCLUSION

In gas chromatography a varian of 3800 gas chromatograph is directly interfaced with a varian of 2000 ion trap mass spectrometer in the case of the volatile compounds. Helium gas was used as the carrier gas at a constant pressure of 10 psi. The gas chromatograph was operated in split less mode using injector which is maintained at the temperature of 260°C. Separation process was performed by using CP-Wax 52 CB, 60 min of time and 0.25 μm of film thickness. Chromatographic oven temperature program was applied at 35°C and held for 5 min, then increase temperature to 80°C at a rate of 3°C/min and after to 250°C at 10°C/min, held at 250°C for 15 min. Transfer the sample line by maintain temperature of 250°C. The mass spectrometer was operated in ion monitoring mode with an acquisition range of 40–200 m/z. Compounds was identified using mass spectral data by the injection standards and calculate the literature data observed.

Furan (C_4H_4O) is a lipophilic contaminant also produced chemically during the heat processing of food products at 200°C. The thermal processes include canning, roasting, baking, and sterilization. Furan has no odor. Furan is a low molecular weight and heterocyclic compound which is volatile in nature having a boiling point of 31.36°C. The volatile nature of furan depends up on food substances lipophilicity and ability to retain more furan.

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