Title (en)

METHOD FOR DETERMINING THE IDENTITY, ABSENCE AND CONCENTRATION OF A CHEMICAL COMPOUND IN A MEDIUM

Title (de)

VERFAHREN ZUR BESTIMMUNG DER IDENTITÄT ODER NICHT-IDENTITÄT UND KONZENTRATION EINER CHEMISCHEN VERBINDUNG IN EINEM MEDIUM

Title (fr)

PROCEDE DE DETERMINATION DE L'IDENTITE OU DE LA NON-IDENTITE ET DE LA CONCENTRATION D'UN COMPOSE CHIMIQUE DANS UN MILIEU

Publication

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Application

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Priority

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Abstract (en)

[origin: DE102005062910A1] The procedure for the confirmation of the presence of a chemical compound contained in a medium (312) for identification of a mineral oil and/or for the examination of the authenticity of a commodity, comprises determining the chemical compound contained in the medium by verification step and determining the concentration of the chemical compound by analysis step. The verification step comprises exposing the medium to a first analysis radiation (316) of a variable wavelength, which assumes two different values, and generating a spectral response function. The procedure for the confirmation of the presence of a chemical compound contained in a medium (312) for identification of a mineral oil and/or for the examination of the authenticity of a commodity, comprises determining the chemical compound contained in the medium by verification step and determining the concentration of the chemical compound by analysis step. The verification step comprises exposing the medium to a first analysis radiation (316) of a variable wavelength, which assumes two different values, generating a spectral response function such as a transmission function and an emission function on the basis of the radiation and forming a spectral correlation function by spectral comparison of the spectral response function with a sample function. The analysis step comprises exposing the medium to the second analysis radiation with an excitation wavelength and generating a spectral analysis function on the basis of the radiation of the response wavelength that is absorbed and/or emitted and/or reflected and/or scattered from the medium as response to the first and second analysis radiations of the wavelength. The sample function represents a spectral measuring function of the medium. The spectral correlation function is a coordinate shift. In a sample recognition step, the spectral correlation function is examined and concluded whether the chemical compound is contained in the medium. The analysis step is accomplished only if it is confirmed in the verification step. The spectral correlation function is formed from the spectral response functions and the sample functions. In the spectral response function-generating step, a raw response function is determined and subsequently transformed as follows into the spectral response function. A wavelength shift is empirically determined by a spectral response function of the medium containing the compound, which is compared with a spectral response function of the reference medium and/or with a reference response function. The spectral response medium is formed from a spectral shift. The spectral correlation function is formed by the comparison of the spectral response function of the compound in another medium and/or with a standard response function. The wavelength shift is determined from a shift of a maximum of a maximum of the spectral correlation function. A spectral background function is empirically determined by a spectral response function of the medium containing the compound that is compared with a spectral response function of the medium not containing the compound and/or with a reference response function. A spectral background function is determined from a deviation in such a manner that a first spectral correlation function is formed by a spectral comparison of the spectral response function with the sample function in accordance with the spectral response function generation step, which is adapted to a second spectral correlation function formed by a spectral self-comparison of the sample function. The emission function and spectral analysis function exhibit a fluorescence function. The spectral background function and/or the wavelength shift are taken from a database, which is sorted according to the media. The excitation wavelength of the second analysis radiation assumes two different values. The spectral analysis function is determined integrally over a wavelength range of the response wavelength, in which the excitation wavelength is not contained in this wavelength range. A lock-in procedure is used in the analysis step, in which a second analysis radiation of the excitation wavelength is periodically modulated with a frequency. The spectral analysis function is determined integrally over a wavelength range of a response wavelength in a time-solved manner. An independent claim is included for a device for confirmation of the presence of a chemical compound contained in a medium.

IPC 8 full level

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