Materials of Conferences

EFFECT OF IRRADIATION IN VISIBLE AND INFRARED RANGE OF SPECTRA ON NUCLEAR MAGNETIC RESONANCE PARAMETERS OF OIL COMPONENTS

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For express-analysis of oils high weight components (asphaltenes, resins, heavy isoparaffins) existing methods of analysis – near infrared spectroscopy, X-rays and mass-spectrometry are not fast enough for operative control and require sample preparation. Nuclear magnetic resonance spectra also can not give information about nanodimensional high molecular compounds and cannot be used as method of control. But optimization of technology, prevention of accidents and ambient protection require express-control of fuels and raw materials. Such opportunities posses nuclear (proton) magnetic resonance relaxometry (NMRR) method, which is demonstrated on the examples of several physic-chemical properties of oils and bitumen determination [1]. NMRR also is unique for slow motions study in aggregates, especially by spin-spin relaxation times T2i. But it was found, that determined by NMRR concentration of asphaltenes and paraffins, differs from determined by ISO 3405-88. This can be explained by restrictions of molecular motion in nondimentional structure fragments and by shortening of relaxation times below the opportunities of NMR-relaxometer (due to dead time of probe coil). We suggested [2, 3] to «warm up» molecular motion in this fragments by irradiating samples at the wave length of their energy absorbance. This will increase amplitude of molecular motions and so selectively increase their relaxation times, which give opportunity to measure them with higher sensibility using NMR-relaxometer.

Effect of laser irradiation in visual and near infrared range of spectra on relaxation times raise DT*2i = T*2i – T2i (where T*2i and T2i are times under and before irradiation) in natural oils is reported. Dependence of NMR-parameters from oil components concentration, affected by irradiation were studied and quantitatively interpreted in terms of energetic levels populations behavior. Correlations of DT*2i with components concentration were revealed.

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2. Patent of Russian Federation claim # 2009138707/19.10.2009.

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ABOUT METHOD OF INCREASING BIOCHEMICAL ACTIVITY OF LACTOSE FERMENTATIVE YEAST

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Lactose fermentative biological objects, being technically useful microflora, should have technological charecteristics. In this regard search of new methods of their cultivation, increasing the efficiency of fermentation process is very important.

Many researchers have been studying influence of medium formulation on microorganisms' growth. So, Zalashko got the best results of cultivating strain S. Fragilis on milk whey adding 0,75 % of ammonia sulphate, 0,5 % of monosubstituted potassium phosphate and 0,1 % of yeastrel (37,05). Wasserman et al. got the maximum crop by adding 0,5 % of ammonia sulphate, 0,5 % of monosubstituted potassium phosphate and 0,1 % of yeastrel to milk serum [1].

According to Bannikova [3] cultivation of yeast in temperature close to upper limits of comfort temperature of growth usually stimulates their growth.

Abramov S.A., Kostenko S.T, Khalilova E.A., Islamova F.I., Omarov M.M. [3] grew yeast on nutritional medium where as mineral and organic nutrition geothermal water of non phenolic class was used, watered down up to mineralization 4,0–4,2 g/l. The method allows decreasing spending deficit components of mineral and organic nutrition.

Abramov S.A., Kotenko S.T., Dalgatova B.I., Efendieva D.A., Khalilova E.A. [4] made nutritious medium for growing bakery yeast in the following way: into molasses watered down up to mineralization 2,0–2,4 g\l we add geothermal water till 9,5 % carbohydrate status and then diammonium phosphate. And medium ratio is (g\l): molasses 160–180, diammonium phosphate 1,0–1,5, geothermal water – the rest.

Polandova R.D. and Bykovchenko T.V [5] worked out a method of getting yeast biomass, providing yeast baking strength improvement up to 20 %, fermentative activity up to 8,0 %, yeast cells increase up to 11,5 %. The method includes preparing brew out of flour and water, its saccharification, fermentation with thermophile lactic-acid bacteria, adding mineral salts K2HPO4 and (NH4)2SO4 and growing yeast on the obtained nutritious medium with extraction of liquid yeast and giving nutritious medium every 3-4 hours.

Thus using microbic cell's ability to change its metabolism with environmental factors changes it becomes real to manage the yield of biomass and base products.

Important object is to increase biomass of lactose fermentative yeast yield. With that it makes sense to use peptone as source of nitrogenous matter, yeastrel as bioactive substance, geothermal water as mineral compound.

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