A VOLTAMPEROMETRIC SENSORY SYSTEM FOR RECOGNITION OF TRYPTOPHAN ENANTIOMERS IN BIOLOGICALLY ACTIVE DIETARY SUPPLEMENTS

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Tryptophan is an indispensable amino acid which is a proteinogenic amino acid and is part of the proteins of all known living organisms. In nature, tryptophan synthesizes microorganisms, plants and mushrooms. Multicellular animals are not able to synthesize tryptophan, they need to get it with protein food. Tryptophan is found in many food products, for example - in black and red caviar, cheese, peanuts, chicken, rabbit meat and turkey. However, often a natural influx of tryptophan not even enough for people who do not exercise and do not experience regular physical activity. A deficiency of tryptophan in the diet can lead to serotonin. Low levels of serotonin are associated with depression, irritability, uselessness, kostvum, impatience, impulsiveness, inability to concentrate, eating, memory problems and insomnia. Therefore, determination of tryptophan in food, pharmaceuticals, food additives and living organisms, especially humans is very important.

Method validity was tested with real samples containing auxiliary substances (calcium pantothenate, pyridoxine, cellulose, silicon and titanium dioxides, gelatin and others). As real samples, L-tryptophan-containing dietary supplements from various manufacturers (Now Foods, Jarrow Formulas, Evalar, and Scitec Nutrition) were chosen. 0.035 mM solutions of Trp enantiomers were used as reference samples and real samples whose solutions had the same concentrations were used as test samples. The recognition results are presented in Table. All real samples were recognised to be L-tryptophan. The percentage of correctly recognized samples is over 80 %, and errors of the second kind are lower of 11 %. It should be noted that with individual GCEs modified by PAP composite of α-, β-, and γ-CD, in the presence auxiliary substances resulted in only 30 % of samples were being correctly recognized. The proposed sensory system is sensitive to the composition of the excipients in biologically active dietary supplements containing L-Trp, which ensures the establishment of the manufacturers.

Table. Discriminant responses (RS/TS) of PLS-DA model in percentage (%) of real samples containing L-tryptophan using sensory system based on GCEs modified by PAP composites of α-, β-, γ-CD

RS* / TS**	Sample 1	Sample 2	Sample 3	Sample 4
Sample 1	89	3	1	7
Sample 2	2	89	11	3
Sample 3	1	10	82	7
Sample 4	7	2	6	88