

# CHEMILUMINESCENCE METHOD FOR THE DETERMINATION OF IBUPROFEN IN PHARMACEUTICAL PREPARATIONS

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**Introduction.** Ibuprofen (Ibu, ( $\pm$ )-2-(p-isobutylphenyl) propionic acid) NSAID, phenylpropionic acid derivative has anti-inflammatory, analgesic and medium antipyretic activity. It is released in the form of covered tablets, capsules, granules, syrups, suppositories. The intensive literature survey revealed the Ibu can be quantitatively determined using spectrophotometric method, HPLC, LC, GC, MS and chemiluminescence method. For example, the CL procedures for the determination in the system Ibu -  $\text{H}_2\text{O}_2$  - Fe (II)/(III) in the presence of Eu(III) ions; by activating effect of Ibu on CL in the system  $\text{KMnO}_4$  - sulfite; CL inhibition in micellar environments in the presence of  $\text{Tb}^{3+}$  ions are known.

**Aim.** The development of new methods for the quantitative determination of Ibu using highly sensitive chemiluminescence method is of a great importance. The new analytical system  $\text{H}_2\text{L}$  (luminol) -  $\text{H}_2\text{O}_2$  - Hb (hemoglobin), in which Ibu acts as an inhibitor of CL is proposed to determine Ibu in tablets.

**Materials and methods.** The research object is «Ibuprofen» in tablets (produced by Privately held corporation «Technolog», Ukraine).

The procedure of quantitative determination of Ibu in "Ibuprofen" tablets, 200 mg is following: approximately 290 mg of grinded tablets (accurately weighed) was dissolved in a 100 mL volumetric flask in 10 mL of  $1 \text{ mol}\cdot\text{L}^{-1}$  NaOH solution. The volume of the solution was brought to the mark with double-distilled water at 293 K. The Ibu SSS solution with a concentration  $2 \text{ mg}\cdot\text{mL}^{-1}$  was prepared similarly using volume-weight method. The following order of reagents mixing was used in the analysis:  $\text{H}_2\text{L}$  solution, NaOH solution, water,  $\text{H}_2\text{O}_2$  solution, SSS solution or a solution prepared from tablets. The working HB solution was added to the chemiluminometer cell with working volume equaling 10.0 mL after all the others.

**Results and discussion.** It was determined that in optimal conditions Ibu had inhibitory effect on the appearance of CL in  $\text{H}_2\text{L}$  -  $\text{H}_2\text{O}_2$  - Hb system, which was further used for the development a new procedure of Ibu quantitative determination in tablets.

**Conclusions.** The procedure of quantitative determination of Ibu in tablets was developed by the chemiluminescence inhibition in the system  $\text{H}_2\text{L}$  -  $\text{H}_2\text{O}_2$  - Hb.  $\text{LOQ} = 3\cdot 10^{-5} \text{ mol}\cdot\text{L}^{-1}$ ,  $\text{RSD} = 3.3\%$  ( $n = 5$ ,  $P = 0.95$ ).