In the citric acid – Mn\textsuperscript{2+} – H\textsubscript{2}SO\textsubscript{4} – KBrO\textsubscript{3} system a hysteresis phenomenon in the switching on and off of the oscillations has been observed. The possible bifurcation diagrams of the system are discussed.

Оscillation reactions still arouse much interest among both the theoretical and experimenting investigators. Analysis of the differential equations describing the model systems of chemical reactions showed that oscillations in the chemical systems are related to the existence of a limit cycle.

A stable limit cycle and an unstable node appear in the process of Hopf bifurcation /1/. They form from a stable node, which is the steady state.

In their theoretical papers dealing with model oscillation reaction systems, Tyson /2/ and Othmer /3/ found an unstable limit cycle to occur. The unstable limit cycle and the stable node are formed in the bifurcation process from an unstable node.

On varying one parameter of the system, which may be the concentration of one parent substance, the unstable limit cycle migrates in the concentration space from a stable limit cycle and next combines with the stable limit cycle and both cycles disappear. This is the third type of bifurcation which might occur in the system.
This process is presented diagrammatically in Fig. 1. The bifurcations discussed in this paper appear at points a, b and c. The arrows indicate changes in the system in the bifurcation points. At point "a" the Hopf bifurcation occurs and the system begins to oscillate.

The oscillation amplitude increases with increasing parameter \( p \). At point "b" an unstable limit cycle and a stable node are formed. With further increase in the parameter \( p \) the amplitude of the unstable limit cycle increases and at point "c" both cycles disappear. The system jumps to the stable node. Oscillations are suddenly interrupted.

Now, if parameter \( p \) decreases, the system will not oscillate up to point "b". At this point the unstable node is formed from the stable node in the bifurcation process and the system jumps to the limit cycle. High-amplitude oscillations occur.

The switching on and off process of oscillations proceeds along a hysteresis curve.

So far hysteresis was found experimentally to occur upon switching on the oscillations in Ref. /4/ in the \( \text{KIO}_3 - \text{HClO}_4 - \text{CH}_2 \cdot \text{COOH}_2 - \text{MnSO}_4 - \text{H}_2 \text{O}_2 \) system.

In the present paper the switching on and off process of oscillations was investigated in the \( \text{H}_2 \text{SO}_4 - \text{MnSO}_4 - \text{KBrO}_3 - \text{citric acid system} \).