

The invention relates to a method for thermally cleaving hydrocarbons in the presence of steam, during which the feed mixture is guided through externally heated tubes with helical inner ribs, and a swirling flow is produced inside the gas mixture in order to homogenize the temperature inside the tube wall and over the tube cross-section and to prevent the deposition of pyrolysis coke on the inner wall of the tube. The swirling flow is gradually introduced with a predominantly axial flow into a core zone and at an increasing radial distance from the ribs.