



**CATALYSTS FOR LOW-TEMPERATURE COMBUSTION OF METHANE FROM  
LOW-CALORIE SOURCES AND METHODS FOR THEIR PREPARATION  
(TECHNOLOGY OFFER P-175 AND P-180)**

*The subjects of the offer are catalysts for low-temperature combustion of methane emitted from anthropogenic sources such as mining, landfills, agricultural production and biomass. The offer includes also the technology of their production.*



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**Methane is one of the most important greenhouse gases, which global warming potential is 23 many times higher in comparison to the carbon dioxide.** Therefore, despite of the lower concentration of methane than of carbon dioxide in the atmosphere, its impact on the Earth's temperature is significant, what implies the need to reduce the emission of methane originating from low-caloric, anthropogenic sources such as mining, landfills, agricultural production and biomass. The problem was investigated during last three decades. Unfortunately, the studies were phenomenological in nature, based mainly on comparative studies.

The most popular method among the methods limiting the emission of methane to the atmosphere is the one based on its catalytic combustion. However, this procedure has disadvantages, mainly due to the high activation energy of methane molecules and also because of the low concentration of methane emitted from anthropogenic sources. **There is no technology allowing effectively combusting of methane with the concentration of 1-2 % and in the economically justified temperatures, i.e. lower than 400°C.**

**The subjects of the offer are the catalysts for the low-temperature combustion of methane** and method of their preparation. The compositions of the catalysts guarantee high activity of the materials and resistance to other components present in the gas stream. Moreover, developed method of catalysts synthesis leads to reproducible properties of the final products. It is simple and can be easily scaled up to an industrial scale.

ul. Czapskich 4  
31-110 Kraków  
phone +48(12) 663 38 30  
fax +48(12) 663 38 31  
cittru@uj.edu.pl  
www.cittru.uj.edu.pl



JAGIELLONIAN UNIVERSITY  
IN KRAKOW

Experimental tests confirm the effectiveness of the catalysts in the range of low and medium temperatures. **It was found, that the conversion of methane is up to 90% at temperatures below 400 °C, wherein the only decomposition products are water and carbon dioxide.**

**The fundamental advantages of offered solutions are:**

- method for preparing catalysts that ensures the repeatability of the parameters and high efficiency in the reactions of methane combustion,
- increased both the activity and the thermal stability of the catalysts in comparison with other systems described in the literature,
- possibility of using the catalysts in the total oxidation of methane emitted from the low-caloric sources at temperatures below 400 °C.

The proposed solutions are the subjects of patent applications. Further development of the inventions is under progress at Faculty of Chemistry, Jagiellonian University. **Currently the Centre for Innovation, Technology Transfer and University Development (CITTRU) is looking for the entities interested in licensing and commercial applications of the described solutions as well as in the cooperation related to the further development of the projects.**



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More information:

**Elżbieta Świętek**

**Section for Innovation**

CITTRU, Jagiellonian University

tel. 012 663 3832, fax.: 012 663 3831

e-mail: [elzbieta.swietek@uj.edu.pl](mailto:elzbieta.swietek@uj.edu.pl)

ul. Czapskich 4  
31-110 Kraków  
phone +48(12) 663 38 30  
fax +48(12) 663 38 31  
[cittru@uj.edu.pl](mailto:cittru@uj.edu.pl)  
[www.cittru.uj.edu.pl](http://www.cittru.uj.edu.pl)