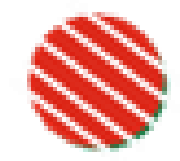


PROCESSING OF TIRES BY CRYO-VIBRATING METHOD

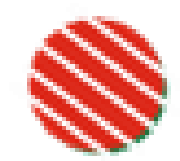
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Head of the laboratory of cryogenic
technologies



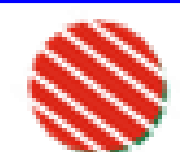
THE AIM OF THE STUDY:

to investigate the efficiency and expediency of using a new cryo-vibration method of tire recycling.



OBJECT OF STUDY:

destructive effect of cryo-vibrating method for separation of rubber crumb and steel cord.



PROBLEMS OF TODAY:

- recycling of only 70% and toxic combustion of another 10% of used tires
- expensive methods
- damage to the environment
- low processing power



Photo 1. Cooling of tire samples in liquid nitrogen

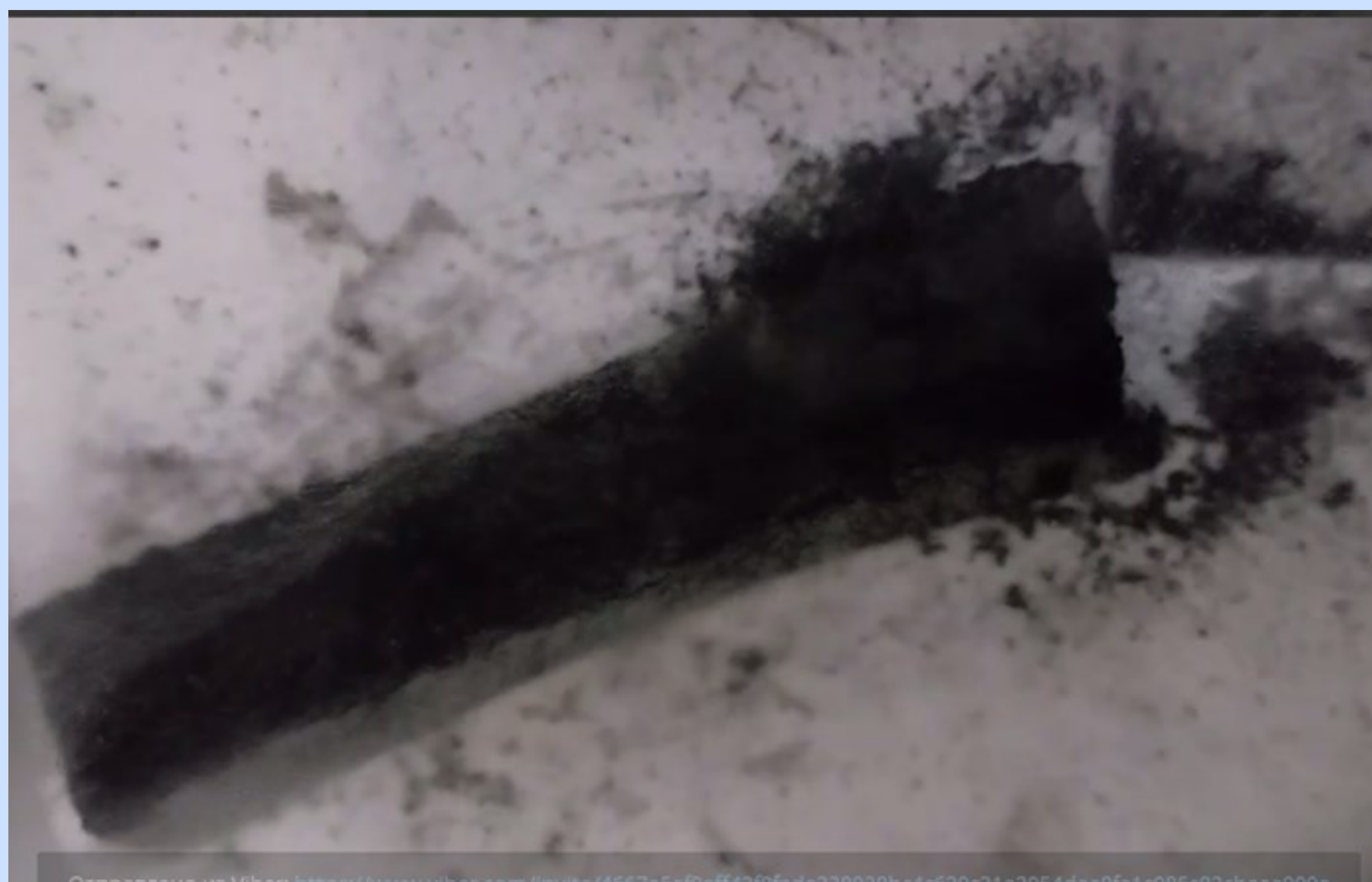


Photo 2. Vibration of the tire sample at the resonant oscillation frequency of the rubber

COURSE OF THE RESEARCH:

1. Elaboration of scientific theoretical sources on the structure and methods of processing (with analysis of the advantages and disadvantages) of tires.
2. Preparation for the experiment: search for the range of resonant oscillation frequency of rubber and setting the cooling temperature to obtain the required level of brittleness of rubber.
3. Two experiments: cooling of the tire sample in liquid nitrogen (photo 1) and subsequent vibration (in and out of liquid nitrogen) for 10-15 minutes at a resonant frequency in the range of 6-8 kHz (photo 2) until complete decomposition into rubber crumb and steel cord.
4. Calculation of the cost of using the method (1350 UAH per 1 ton of tires).

RESULTS:

- The cryo-vibrating method is effective and can be implemented in industry.

for overcoming the existing problem

- Using completely environmentally friendly, cheaper and faster compared to various other recycling methods;

environmental protection and energy saving

- Using the cryo-vibrating method, we obtained rubber crumb and steel, which can be reused in production as a regenerate in new tires, pavements for sports grounds and roads and material for new rubber products

preservation of materials and their valuable properties



Photo 3. Separated rubber crumb and steel cord