



Smart and green interfaces: Fundamentals and diagnostics

*COST Action MP1106: Smart and green interfaces -
from single bubbles and drops to industrial,
environmental and biomedical applications (SGI)*



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PI:6. Oil products flames quelling with fluoroprotein foaming agents

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The fluoroprotein foaming agents are lately used for the purpose of dousing an implicate fires. The foam of these compounds retains protein foams' high qualities i.e. high thermo- and hydrostatic stability, and due to the continuity of fluorocarbon superficial active substances (FSAS) acquires a solid spreadability and inaction to hydrocarbon reactions enabling to contain fire extinguishing properties for foam when mixed with a fuel. For fluoroprotein foaming agents' incidence expansion it is necessary to define foam's quenchability technique and disclose optimum technological parameters of foams used during oil products flames quelling.

The work presents fluoroprotein foaming agents that might be used for oil extinguishment by bringing foam to the burning top and a sublayer method. Here, the foaming agent concentration makes up 6.0 %, and a critical intensity magnitude is within 0.03 – 0.04 kg/m²/c. The oil contamination level for foam is dependent on its delivery modality. If the foam is delivered to the oil product layer with intensity magnitude of 0.08 kg/m²/c the contamination rate levels to 2.5% of mass providing a good foam insulating effect.

A suggested extinguished mechanism and a developed model for dousing with fluoroprotein foaming agents account for viscosity changeability, thermal stability, and foam self-induced spreadability with multiple content of fluoroprotein stabilizer. The foam significant destructive process is considered to be a formation of protein-contained carbonized layer on the outer surface of foaming bubbles affected by the fire heat flow. Within the proposed modality of extinguishment by fluoroprotein foams the quantitative analysis has been held for a foam material balance resulting in a semi-empirical ratio obtained for oil extinguishing time assessment.

A recommended method for fluoroprotein control and fluorocarbon stabilizer optimal concentration provides for thermal stability, preserved foam self-spreadability on the oil products surface, and foam thermal stability influenced by flames heat flow.

The practical and theoretical researches compilations conducted to recommending of especial recipe for fluoroprotein foaming agent with optimum content of protein component and fluorinated additives.