

PhD THESIS ABSTRACT
**„THEORETICAL AND EXPERIMENTAL CONTRIBUTIONS REGARDING
TECHNOLOGIES AND MATERIALS USED IN CHEMICAL AND RADIOACTIVE
DECONTAMINATION”**

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This PhD thesis represents the theoretical and experimental research conducted by the author in order to develop and characterize new solutions for chemical and radioactive decontamination of surfaces.

The requirement to take action in a contaminated environment is essential if the use of those areas and rooms is to continue. There are many methods of decontamination. However, there is no universal method for decontaminating all types of materials contaminated with various toxic substances, even if this is the ideal case. However, this paper propose to study and develop new types of decontamination solutions, which after solvent evaporation form polymeric films that retain toxic substances inside, and the surfaces are decontaminated by removing these strippable coatings. These films have an innovative composition, containing biodegradable, non-toxic, non-carcinogenic and ecofriendly materials.

The paper consists of 6 chapters essential for achieving the main objective, and each chapter ends with a series of conclusions that define the results obtained from the analyzes or studies performed within.

The paper begins with the *Introduction* of the thesis that justifies the approach of the topic, as well as its relevance. Then, the research methods addressed here are briefly described and last but not least the personal contributions of the author.

The first chapter, *"Current state of art of technologies and materials used in CBRN decontamination"*, summarized in a few pages the types of toxic agents that need to be decontaminated and different methods of their decontamination.

For in chapter 2, *"Theoretical and experimental contributions on the development of strippable coatings"*, the attention is directed to the study of commercial film-forming materials, their composition and their use. Then, this chapter ended with the proposal and development of new types of decontamination compositions.

The experimental approach of the paper began with the solution development, described in chapter 2, and continued with the physico-chemical, thermal, thermo-mechanical and mechanical characterization of the coatings in Chapter 3 that is named *"Experimental research on determining the material characteristics and properties of solutions / decontamination films"*.

The defining property of the strippable coatings is their decontamination performance for both heavy metals and radioactive materials, defined by the results of experimental analyzes described in chapter 4, *"Experimental research on the decontamination efficiency of new polymeric films"*.

In chapter 5, *"Theoretical and experimental contributions on the decontamination solutions production technology and waste management of the resulting contaminated strippable coatings"*, proposes a simplified method for batch production of the decontamination material, and discusses the methods of treatment and management of the resulting waste that follows the decontamination process of toxic materials.

The last chapter called *"Conclusions. Personal contributions. Future directions of research. Results dissemination."* brings together all the ideas presented and the previous chapters and concludes the thesis by presenting the contribution of the author.