

Contents

Preface	9
PART ONE RAW MATERIAL AND ENVIRONMENTAL SAFETY OF INDUSTRIAL PROCESSES	11
IZABELA GABRYELEWICZ, MACIEJ WĘDRYCHOWICZ, PÉTER PÁNTYA, PATRYK KRUPA	
1. Landscape coating of the globe	11
1.1. Atmosphere	11
1.2. Hydrosphere	13
1.3. Lithosphere	16
2. Raw materials and non-energy materials for industry	17
2.1. Production process	17
2.2. Criteria for selection of raw materials, materials and technologies	18
2.3. Resources, raw materials and materials	19
2.4. Raw material and secondary raw materials processing	23
2.5. Substitution	23
3. Environmental protection strategies	24
3.1. Development stages of the environmental protection model	24
3.2. Environmental aspects and their impact on the environment.	26
3.3. Clean production	27
3.4. Circular production process	27
4. Tools supporting environmental assessment of production processes	30
4.1. Life Cycle Analysis	30
4.2. Best Available Technique	33
4.3. Environmental Impact Assessment	33
4.4. Value analysis	34
5. Summary	34

PART TWO	RAW MATERIALS AND MATERIALS	39
6.	Treatment of copper slag with concentrated solar energy	39
	DANIEL FERNÁNDEZ-GONZÁLEZ, JANUSZ PRAZUCH, ÍÑIGO RUIZ-BUSTINZA, CARMEN GONZÁLEZ-GASCA, CRISTIAN GÓMEZ-RODRÍGUEZ, LUIS FELIPE VERDEJA	
6.1.	Introduction	39
6.2.	Materials and methods	42
6.3.	Thermodynamics of the process	46
6.4.	Results and discussion	50
6.5.	Discussion	54
6.6.	Conclusions	55
7.	Determination of critical heat flux for burning initiation of office paper	60
	PETER RANTUCH, IGOR WACHTER, JOZEF MARTINKA	
7.1.	Introduction	60
7.2.	Materials and methods	66
7.3.	Results and discussion	69
7.4.	Conclusion	75
8.	Fire hazard assessment of upholstery materials based on thermal analysis results – case study	79
	EMÍLIA ORÉMUSOVÁ, ANDREA MAJLINGOVÁ, QIANG XU, NORBERT KAČLÍK	
8.1.	Introduction	79
8.2.	Methodology	80
8.3.	Results	82
	8.3.1. Results of the thermogravimetry analysis	82
	8.3.2. Results of the differential scanning calorimetry analysis	92
8.4.	Discussion	102
8.5.	Conclusions	103
PART THREE	ORGANIZATIONAL AND IT SOLUTION	105
9.	Possibilities of using transport safety sheet in safety management of transport of dangerous goods, environmental safety and drivers' work	105
	MAREK RYBAKOWSKI	
9.1.	Introduction	105
9.2.	Transport of dangerous goods by road, rail, sea and air	107
9.3.	The overall picture of the risks	111
9.4.	Transport Safety Sheets as an innovation in raising the level of safety of the road transport of dangerous goods and driver's work	111
9.5.	Selected chemical materials for transport – their description and transport Safety Sheet projects	113
	9.5.1. Methanol	114
	9.5.2. Oil	117
	9.5.3. Propane-butane gas	120

9.6. Raising the level of safety of the road transport of dangerous goods and driver's work	123
9.7. Conclusion	123
10. Explosion protection in the production plant	126
REMIGIUSZ AKSENTOWICZ, WALDEMAR UŹDZICKI, ANGELIKA WALTROWSKA	
10.1. Introduction	126
10.2. Safety requirements.	126
10.2.1. Basic legal requirements	127
10.2.2. Explosion risk assessment	128
10.2.3. Explosion hazard zones	132
10.2.4. Explosion protection document	133
10.2.5. Safety requirements – ATEX directive	134
10.3. Explosion protection using the example of a production company	136
10.3.1. Division of explosion hazard zones.	137
10.3.2. Pressure increase in the production hall	139
10.3.3. Explosion risk assessment	140
10.3.4. Prevention of and protection against explosions	141
10.4. Summary and conclusions	142
11. The prototype of an expert system supporting the recognition of exotic wood species	144
RENATA JOLANTA KASPERSKA	
11.1. Introduction	144
11.2. Materials	145
11.2.1. Decorative properties	145
11.2.2. Physical properties.	146
11.2.3. Mechanical properties	147
11.2.4. Chemical properties	147
11.3. Methods of wood identification	147
11.4. Realization of the expert system	149
11.5. Contents of the expert knowledge base	151
11.6. Conclusion	158
PART FOUR CONCLUSIONS AND FURTHER RECOMMENDATIONS	161
List of Contributors	163
About the Editors	165