

References

1. Famielec S, Wiczorek-Ciurowa K. Incineration of tannery waste in a tunnel furnace system. *Civil and Environmental Engineering Reports* 2013; 10: 63-72.
2. Ławińska K, Obraniak A, Modrzewski R. Granulation Process of Waste Tanning Shavings. *FIBRES & TEXTILES in Eastern Europe* 2019; 27, 2(134): 107-110. DOI: 10.5604/01.3001.0012.9994.
3. GUS. *Rocznik statystyczny przemysłu 2016*. Warszawa.
4. Zengin G, Ozgunay H, Mavioglu Ayan E, Mete Mutlu M. determination of dyestuffs remaining in dyeing processes of vegetable-tanned leathers and their removal using shavings. *Pol. J. Environ. Stud.* 2012; 21, 2: 479-506.
5. Wu C, Zhang W, Liao X, Zeng Y, Shi B. Transposition of chrome tanning. *Journal of the American Leather Chemists Association* 2014; 109: 176-183.
6. Sharaf S A A, Gasmeeled G A, Musa A E. Reduction of hexavalent chromium from chrome shavings. *International Journal of Advance Industrial Engineering* 2013; 1, 1: 24-27.
7. Cabeza L F, Taylor M M, DiMaio G L, Brown E, Marmer W N, Carrió R, Celma P J, Cot J. Processing of leather waste: pilot scale studies on chrome shavings. II. Purification of chrome cake and tanning trials. *Journal American Leather Chemists Association* 1998; 93, 3: 83-98.
8. Rao J R, Thanikaivelan P, Sreeram KJ, Nair B U. Green route for the utilization of chrome shavings (chromium-containing solid waste) in tanning industry. *Environ. Sci. Technol.* 2002; 36, 6: 1372–1376.
9. Rao J R, Thanikaivelan P, Sreeram K J, Nair B U. Tanning studies with basic chromium sulfate prepared using chrome shavings as a reductant: a call for 'wealth from waste' approach to the tanning industry. *Journal of the American Leather Chemists Association* 2004; 99: 170-176.
10. Erdem M. Chromium recovery from chrome shaving generated in tanning process. *Journal of Hazardous Materials* 2006; B129: 143–146.
11. Pillai P, Archana G. A novel process for biodegradation and effective utilization of chrome shavings, a solid waste generated in tanneries, using chromium resistant *Bacillus subtilis* P13. *Process Biochemistry* 2012; 47: 2116–2122.
12. Aftab M N, Hameed A, Ul-Haq I, Sheng C R. Biodegradation of leather waste by enzymatic treatment. *Chinese Journal of Process Engineering* 2006; 6, 3: 462-465.
13. Taylor M M, Diefendorf E J, Na G C, Marmer W N. *Enzymatic processing of materials containing chromium and protein*. US Patent No 5094946A, 1992.
14. Cabeza L F, Taylor M M, DiMaio G L, Brown E, Marmer W N, Carrió R, Celma P J, Cot J. Processing of leather waste: pilot scale studies on chrome shavings. Isolation of potentially valuable protein products and chromium. *Waste Management* 1998; 18: 211-218.
15. Ławińska K, Gendaszewska D, Grzesiak E, Jagiello J, Obraniak A. Use of tanning waste in seed production. *Przemysł Chemiczny* 2017; 96, 11: 2344-2347.
16. Ławińska K, Gendaszewska D, Grzesiak E, Lason-Rydel M, Obraniak A. Coating of leguminosarum seeds with collagen hydrolyzates from tanning waste. *Przemysł Chemiczny*. 2017; 96, 9: 1877-1880.
17. Ławińska K, Lason-Rydel M, Gendaszewska D, Grzesiak E, Sieczynska K, Gaidau C, Epure D G, Obraniak A. Coating of Seeds with Collagen Hydrolysates from Leather Waste. *FIBRES & TEXTILES in Eastern Europe* 2019; 27, 4(136): 31-36.
18. Marsal A, Maldonado F, Cuadros S, Bautista M E, Manich A M. Adsorption isotherm, thermodynamic and kinetics studies of polyphenols onto tannery shavings. *Chemical Engineering Journal* 2012; 183, 21-29.

19. Tahiri S, Albizane A, Messaoudi A, Azzi M, Bennazha J, Alami Younssi S, Bouhria M. Thermal behaviour of chrome shavings and of sludges recovered after digestion of tanned solid wastes with calcium hydroxide. *Waste Management* 2007; 27: 89–95.
20. Przepiórkowska A, Stańczak M. Recovery of collagen derived from tanned leather waste materials. *Przemysł Chemiczny* 2003; 82, 8-9: 1146-1148.
21. Przepiórkowska A, Chrońska K, Zaborski M. Chrome-tanned leather shavings as a filler of butadiene–acrylonitrile rubber. *Journal of Hazardous Materials* 2007; 141: 252–257.
22. Sahari J, Salit MS, Zainudin ES, Maleque MA. Degradation Characteristics of SPF/SPS Biocomposites. *FIBRES & TEXTILES in Eastern Europe* 2014; 22, 5(107): 96-98.
23. Mohanty A K, Misra M, Drzal L T. Sustainable bio – composites from renewable sources: opportunities and challenges in the green materials world. *Journal of Polymers and the Environment* 2002; 10: 19-26.
24. Ławińska K, Serweta W, Modrzewski R. Qualitative Evaluation of the Possible Application of Collagen Fibres: Composite Materials with Mineral Fillers as Insoles for Healthy Footwear. *FIBRES & TEXTILES in Eastern Europe* 2018; 26, 5(131): 81-85. DOI: 10.5604/01.3001.0012.2536
25. Ławińska K, Serweta W, Modrzewski R. Studies on water absorptivity and desorptivity of tannery shavings-based composites with mineral additives. *Przemysł Chemiczny* 2019; 98(1): 106-109.
26. Ławińska K, Modrzewski R. Analysis of sieve holes blocking in a vibrating screen and a rotary and drum screen. *Physicochemical Problems of Mineral Processing*. 2017; 52, 2: 812-828.
27. Ławińska K, Modrzewski R, Wodzinski P. Mathematical and empirical description of screen blocking. *Granular Matter*. 2016. 18, 1:13.
28. Ławińska K, Wodziński P, Modrzewski R. A method for determining sieve holes blocking degree. *Physicochemical Problems of Mineral Processing* 2015; 51, 1: 15-22.
29. Ławińska K, Modrzewski R, Wodziński P. Comparison of the potential of using drum and vibrating screens for segregating mineral and municipal waste. *Rocznik Ochrona Środowiska* 2015; 17, 2: 1365-1388.
30. Modrzewski R, Wodziński P. The results of process investigations of a double - frequency screen. *Physicochemical Problems of Mineral Processing* 2010; 44: 169-178.
31. Modrzewski R, Wodziński P. Screens for segregation of mineral waste. *Physicochemical Problems of Mineral Processing* 2011; 47:267-274.
32. Ławińska K, Modrzewski R, Serweta W. The phenomenon of screen blocking for mixtures of varying blocking grain content. *Mineral Resources Management* 2018; 34, 1: 83-95.
33. Obraniak A, Gluba T, Ławińska K, Derbiszewski B. Minimisation of environmental impact related with storing fly ash resulting from hard coal combustion. *Environment Protection Engineering* 2018; 44, 4: 177-189.
34. Obraniak A, Lawinska K. Spectrophotometric analysis of disintegration mechanisms (abrasion and crushing) of agglomerates during the disc granulation of dolomite. *Granular Matter* 2018; 20: 7.
35. Prochoń M, Biernacka A, Witczak A. Kompozyty ceramiczne jako pełne wykorzystanie zalet ceramiki. *Eliksir* 2017; 1, 5: 15-16.
36. Peiwei G, Xiaolin L, Shaochun J, Hui Z, Chunxing G. Using a new composite expansive material to decrease deformation and fracture of concrete. *Materials Letters* 2008; 62: 106–108.
37. Ławińska K, Gendaszewska D, Kozar O, Sprynskyy M, Wionczyk B. Studies on selected properties of natural mineral modified leathers with the addition of

- polyhexamethylenebiguanide-based preparation. *Technologia i Jakość Wyrobów* 2017; 62: 86-95.
38. Materials Data Book. Cambridge University Engineering Department. Edition 2003.
 39. Góralczyk S, Kukielska D. The quality of Polish aggregates. *Górnictwo i Geoinżynieria*. 2010; 34(4): 211-224.
 40. Szczerba J, Prorok R, Goławski C, Madej D, Śnieżek E. Effect of selected ecological coal-tar pitches on the properties of dolomite refractories. *Materiały Ceramiczne* 2011; 63(4):779-785.
 41. Wyszomirski P, Lewicka E. Bentonite as a versatile industrial mineral for different markets. *Gospodarka Surowcami Mineralnymi* 2005; 21(3): 5-19.
 42. Jonczy I, Borówka B. Characteristics of near-surface part of the Orzesze beds in the region of the main saddle in view of weathering processes. *Mineral Resources Management* 2016; 32(2): 111-124.
 43. Obraniak A, Gluba T. Model of energy consumption in the range of nucleation and granule growth in drum granulation of bentonite. *Physicochemical Problems of Mineral Processing* 2012; 48 (1): 121-128.
 44. Pehlivan H, Ozmihi F, Tihminlioglu F, Balkose D, Ulku S. Water and water vapor sorption studies in polypropylene - zeolite composites. *Journal of Applied Polymer Science*. 2003; 90: 3069-3075.
 45. Huuhilo T, Martikka O, Butylina S, Karki T. Impact of mineral fillers to the moisture resistance of wood – plastic composites. *Baltic Forestry* 2010; 16, 1: 126-131.
 46. Falkiewicz-Dulik M. Characteristics of the materials used in the insoles. *Technologia i Jakość Wyrobów* 2016; 61: 86-94.
 47. Serweta W, Olejniczak Z, Woźniak B. Analysis of Insole Material Impact on Comfort During Physical Exertion. *FIBRES & TEXTILES in Eastern Europe* 2018; 26, 2(128): 100-103. DOI: 10.5604/01.3001.0011.5746.