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HEAVY METALS REMOVAL OF LEACHATES FROM A MECHANICAL BIOLOGICAL MUNICIPAL SOLID WASTE TREATMENT PLANT FOR USE AS FERTILIZERS

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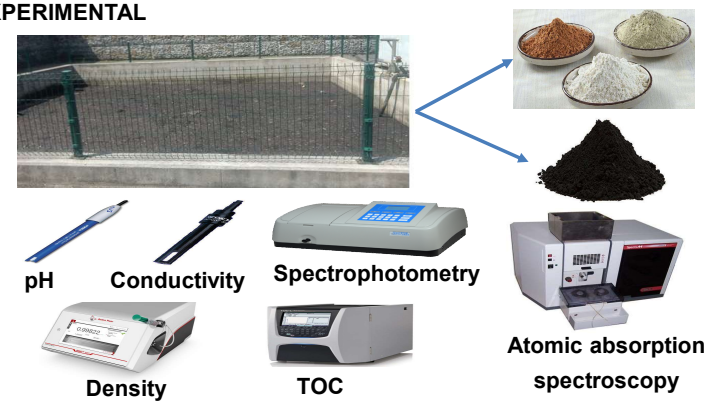
INTRODUCTION

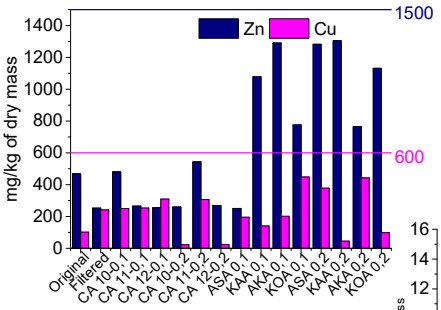
Leachates produced from treatment plants contains carbon, nitrogen, phosphorus, potassium and trace elements. This work aims to develop heavy metals removal processes using solid adsorbents synthetized at CIMO and LSRE-LCM laboratories at Polytechnic Institute of Bragança, such as activated carbon produced from a compost material from the same treatment plant and modified clays obtained through a partnership with a Kazakhstan institution, to adequate the leachate from the composting line of a mechanical and biological treatment facility, into commercial fertilizers which fit the requirements of the European Legislation. Preliminary results show that the adsorption materials promoted a reduction in the heavy metals content, but this reduction also affected the organic carbon content. However, the activated carbons (AC) presented a better potential for heavy metals removal.

EXPERIMENTAL



RESULTS

Samples	%TOC	Samples	%TOC
EU 2016	3	ASA 0.1	2.48
Original	2.81	KAA 0.1	2.39
Filtered	2.79	AKA 0.1	2.39
AC 10-0.1	2.03	KOA 0.1	2.37
AC 11-0.1	1.98	ASA 0.2	2.41
AC 12-0.1	2.02	KAA 0.2	2.51
AC 10-0.2	2.30	AKA 0.2	2.38
AC 11-0.2	2.36	KOA 0.2	2.52
AC 12-0.2	2.07		



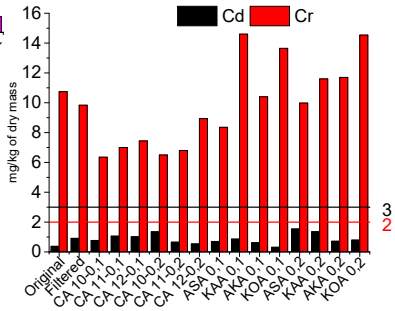
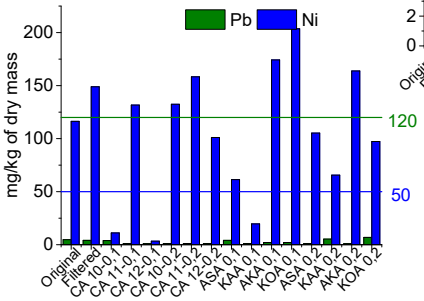


Fig 1. Heavy metals content.



CONCLUSION

The concentrated leachate cannot be used, at this point, as a fertilizer because it does not fit all the legislation requirements, but it still displays potential for future use. It shows high TOC contents. Although the adsorption [illegible] heavy metals content, this reduction also affected the organic carbon content, which is not an intended effect since it can affect negatively the fulfillment of the TOC requirements. Overall the activated carbons produced from the compost presented a better potential for heavy metals removal. Nevertheless ion-exchange resins will be now tested for a more efficient heavy metals removal in order to minimize possible secondary elimination of useful components such as nutrients or organic carbon.

ACKNOWLEDGMENTS

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