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Construction and demolition waste as a non-inert technogenic soil parent material

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Abstract (max. 400 words)

The presence of the mixed waste from the construction and demolition of buildings (CDW) in urban soils has been a widespread phenomenon over the centuries. Nowadays, a mixed waste that originates from the construction and demolition of buildings, is considered as one of the most important technogenic materials deposited in/on soils. This is because of the almost half of the solid waste generated in Europe and one third of the total waste stream and worldwide. For the waste management sector the majority of construction and demolition waste can be regarded as inert (over 90%) and has only little negative impact on the environment. We cannot agree with this point of view considering a presence of technogenic soil-forming materials as a factor of urban soils degradation. We can observe the effects of ageing of CDW causing chemical compounds release to the soils and change of their physical and physic-chemical characteristics.

In order to show the influence of historical and contemporary CDW deposits, field and laboratory tests of construction materials and technogenic soils were carried out in the city of Zielona Góra (western Poland).

As a result of the research it was noted, that the impact of different artefacts made of CDW on soils of the urban area of Zielona Góra varies. The CDW forms the granulometric fraction of the soil skeleton with parts of diameter above 2 mm, which is significantly larger compared to soils of natural origin. It causes changes in the structure of soil and its sorption and retention properties, and thus affects the circulation of water and elements in soil. CDW as a mixture of different materials often contains lime and other calcium compounds that are chemically highly reactive, which causes significant changes in the physic-chemical properties of urban soils, mostly in terms of the content of $CaCO_3$ along with the pH as chemical composition. Under any circumstances they should not be considered as inert to the soil environment. Even CDW without highly reactive chemical compounds as construction sands and gravels cannot be considered environmentally neutral as far as its impact on soil is concerned. They change most of the characteristics of soil. As an effect of disturbances caused by the high content of CDW, the geomechanically and chemically transformed urban soils can be environmentally instable.