

Draft of Substance Identity Profile (SIP) for Ashes (residues), plant Substance Sameness Checking

Ashes (residues), plant

Reference in RIP 3.10 from REACH	UVCB subtype where the source is chemical or mineral and the process is a synthesis / refinement.
Name	Ashes from fluidized bed and classical combustion biomass fired power stations
Other names	Ashes (residues), plant Biomass ash
EC Number	297-049-5
CAS Number	93333-79-0
Description	The residuum from the burning in Fluidized Bed or classical Combustion boilers. The substance consists mainly of following oxides: silicon, aluminium, iron, calcium, titanium, sodium, potassium, magnesium and phosphorous.
Origin	Fired raw-materials: wooden chips and different types of plants Biomass results from natural process of plant growth. The organic chemical materials are produced at combustion while produce heat. Mineral matter remains as the residue and it is called biomass ash.
Process	For the combustion process biomass is fed into a boiler. Depending on the situation the biomass can be crushed or milled. <u>Fluidized bed combustion:</u> This material is inside the boiler and form the so called "bed" that is suspended on jet on air and it is very similar to boiling liquid. This is where the name fluidized comes from because it resembles a liquid. The combustion takes place at temperatures usually from 800 to appr. 950°C. Biomass ash (both of fly ash and bottom ash) is produced inside the boiler. Biomass fly ash is carried along with the flue gas and leaves the furnace in the upper part of the boiler. It is mostly collected in electrostatic precipitators or mechanically by separation in fabric filters. Biomass bottom ash is collected at the bottom part of the boiler and represents the coarser part of the ash. Biomass fly ash and bottom ash may be mixed and extracted together as Biomass ash. <u>Classical combustion:</u> The thermal conversion takes place usually at a range of temperatures from 1100 up to 1700°C in dry or wet bottom boilers. Biomass fly ash is carried along with the flue gas and leaves the furnace in the upper part of the boiler. It is

	<p>mostly collected in electrostatic precipitators or mechanically by separation in fabric filters. Biomass slag is collected at the bottom part of the boiler and represents the coarser part of the ash. Biomass fly ash and slag may be mixed and extracted together as Biomass ash.</p>
Chemical composition	Chemical composition of Biomass ash is usually reported as the mass percent of following components:

Component	Min.	Max.
CaO (total)	0,5	45
SO ₃	1	25
MnO	< 2	
SiO ₂	10	55
Al ₂ O ₃	3	35
Fe ₂ O ₃	0,2	12
TiO ₂	0,2	5
MgO	0,5	7
Na ₂ O	0,01	10
K ₂ O	0,2	30
P ₂ O ₅	0,1	12

LOI (950°C) < 10%

Content of compounds of very high concern in above mentioned substance is limited to be lower than 0.1% in sum.

Mineralogical composition

glass/ amorphous material	> 40
Quarz [SiO ₂]	< 25
Hämatit [Fe ₂ O ₃]	< 10
Free lime [CaO]	< 10
Arcanite [K ₂ SO ₄]	< 20
Illite [K _{0,65} Al ₂ (AlSi ₃ O ₁₀)(OH) ₂]	< 15
Feldspars	< 35