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(54) Titre : **MATERIAUX CIMENTAIRES SUPPLEMENTAIRES COMPRENANT DES SEDIMENTS DE DRAGAGE**
(54) Title: **SUPPLEMENTARY CEMENTITIOUS MATERIALS COMPRISING DREDGED SEDIMENTS**

(57) **Abrégé/Abstract:**

The object of this invention is a supplementary cementitious material to be used in combination with an activator such as Portland cement to produce a hydraulic binder. The supplementary cementitious material is based on physico-chemically treated filter cake product extracted from dredged sediments and can partially replace Portland cement clinker in conventional concrete applications with positive effects on sustainability (reduction of CO₂ emissions, upcycling of residues).

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(54) Title: SUPPLEMENTARY CEMENTITIOUS MATERIALS COMPRISING DREDGED SEDIMENTS

(57) Abstract: The object of this invention is a supplementary cementitious material to be used in combination with an activator such as Portland cement to produce a hydraulic binder. The supplementary cementitious material is based on physico-chemically treated filter cake product extracted from dredged sediments and can partially replace Portland cement clinker in conventional concrete applications with positive effects on sustainability (reduction of CO₂ emissions, upcycling of residues).



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Claims (clean copy)

1. Method for producing a supplementary cementitious material (SCM) characterized in that it comprises the steps:
 - a) providing dredged sludge comprising at least 50 wt.% to at most 90 wt.% water, at least 0 to at most 60 wt.% dry matter-based (DM) coarse fraction, and at least 40 wt.% DM fine fraction;
 - b) removing the sand fraction from the dredged sludge, thereby retaining the fine fraction of the dredged sludge, the fine fraction comprises less than 30 wt.%, preferably less than 10 wt.% grains having a grain size larger than 63 μm ;
 - c) adding of portlandite (slaked lime, $\text{Ca}(\text{OH})_2$), or quicklime (CaO) to the fine fraction;
 - d) dewatering of the fine fraction, thereby forming dried filter cake precursor; and,
 - e) thermally treating the dried filter cake precursor.
2. The method according to claim 1 wherein step e) involves calcination of the dried filter cake precursor.
3. The method according to claim 1 or 2 wherein step e) involves flash calcination of the dried filter cake precursor.
4. The method according to claim 3 wherein flash calcination involves heating the dried filter cake precursor for at least 0.10s to at most 10s at a temperature of at least 800°C to at most 1100°C.
5. The method according to claim 1 or 2 wherein step e) involves heating the dried filter cake precursor in a rotary kiln; to a temperature between at least 550°C and at most 850°C, preferably between at least 650°C and at most 750°C; for at least 20 minutes to at most 3 hours.
6. The method according to any one of claims 1 to 5 wherein the dried filter cake precursor comprises at least 40 to at most 99 wt.% DM hydrous aluminosilicates and at least 1 to at most 15 wt.% DM calcium (alumino-)silicate hydrates; wherein the calcium (alumino-)silicate hydrates are products of the pozzolanic reaction between $\text{Ca}(\text{OH})_2$ and the fine fraction of the dredged sludge.
7. The method according to any one of claims 1 to 6 wherein step c) involves adding portlandite ($\text{Ca}(\text{OH})_2$) to the fine fraction of the dredged sediments in a quantity of 2 to 10

wt.% DM, or wherein step c) involves adding quicklime (CaO) in a quantity of 2 to 7 wt.% DM

8. The method according to any one of claims 1 to 7 wherein the fine fraction comprises less than 60 wt.% physisorbed water.

9. The method according to any one of claims 1 to 8 wherein step d) involves mechanically dewatering the fine fraction.