CLAIMS

1. Continuous process for nanomaterial synthesis from ~~the~~ detonation of an at least one emulsion, **comprising** the following steps:

~~preparation of a synthesis emulsion, containing nanomaterial precursors, from the emulsification of two immiscible phases -internal and external;~~

~~sensitization, ignition and detonation of the emulsion at pressures from 50,000 to 115,000 bar;~~

~~wherein stages in step b) occur simultaneously.~~

(a) preparation of an internal phase and an external phase of the at least one emulsion~~s~~, in desired amounts for the intended production;

(b) emulsification of the internal and external phases, under the effect of mechanical energy;

(c) sensitization of the at least one emulsion;

(d) pre-forming the at least one emulsion into the desired geometry for the composition;

(e) feeding the at least one emulsion into the reactor;

(f) ignition of the at least one emulsion;

(g) detonation of the at least one emulsion;

(h) collection of the nanomaterial;

wherein the sensitization, pre-forming, feeding, ignition and detonation steps (c; d; e; f; g) take place simultaneously.

~~Process according to the preceding claim, **wherein** step b) further comprises a pre-forming stage.~~

2. Process according to the preceding claim~~s~~, **wherein** the ~~said~~ at least one emulsion comprises ammonium nitrate and precursors selected from the group comprising~~such as, preferably~~: soluble oxidizers, ~~or~~ soluble propellants and~~or~~ insoluble precursors in the internal phase or hydrocarbon derivatives~~,~~ ~~or~~and propellant precursors miscible in the external phase, or metals, or mixtures thereof.

3. Process according to any one of the preceding claims, **wherein** the precursors may be fed either into~~n~~ the internal phase or external phase ~~of the emulsion,~~ or subsequently in~~to~~ the emulsification step.

4. Process according to any one of the preceding claims, **wherein** the total amount of precursors is inferior to 70% in weight of the ~~overall composition~~at least one emulsion.

5. Process according to any one of the preceding claims, **wherein** said precursors are selected from the group comprising carbonates, ~~or~~ oxides, ~~or~~ hydroxides~~,~~ and ~~or~~ mixtures thereof.

6. Process according to any one of the preceding claims, **wherein** the ~~synthesis~~ at least one emulsion comprises ammonium nitrate dissolved in water.

7. Process according to any one of the preceding claims, **wherein** hydrocarbon derivatives in the external phase comprise at least one of the following compounds: waxes, liquid hydrocarbons or oils, ~~or~~ and mixtures thereof.

8. Process according to any one of the preceding claims, **wherein** hydrocarbon derivatives ~~in the external phase~~ have a viscosity index from 0.004 to 0.020 Pa.s, when liquefied.

9. Process according to any one of the preceding claims, **wherein** the ~~emulsion~~ external phase further includes a surfactant compound.

10. Process according to any one of the preceding claims, **wherein** the emulsification ~~stage~~ step takes place per batch.

~~Synthesis process according to any preceding claim, **wherein** the sensitization of the emulsion takes place only upon feeding into the synthesis reactor.~~

11. Process according to any one of the preceding claims, **wherein** said sensitization step is carried out by injecting and homogenizing of an inert gas within the ~~said~~ at least one emulsion, or by means of a chemical reaction or by adding solid particles which retain the gas therein.

12. Process according to any one of the preceding claims, **wherein** said ~~synthesis emulsion~~the detonation step is carried out by capacitive discharge or laser.

13. Process according to the preceding claim, **wherein** said detonation step further comprises the addition of an ignition emulsion.

14. Process according to any one of the preceding claims, **wherein** the collection step~~of said nanomaterial~~ is carried out *in secco*.

15. Process according to any one of the preceding claims, **wherein** ~~the~~ said collection step ~~of said nanomaterial~~ is carried out within a cyclone battery.

CLAIMS

1. Continuous process for nanomaterial synthesis from detonation of an at least one emulsion, **comprising** the following steps:
   a) preparation of an internal phase and an external phase of the at least one emulsion, in desired amounts for the intended production;
   b) emulsification of the internal and external phases, under the effect of mechanical energy;
   c) sensitization of the at least one emulsion;
   d) pre-forming the at least one emulsion into the desired geometry for the composition;
   e) feeding the at least one emulsion into the reactor;
   f) ignition of the at least one emulsion;
   g) detonation of the at least one emulsion;
   h) collection of the nanomaterial;

   wherein the sensitization, pre-forming, feeding, ignition and detonation steps (c; d; e; f; g) take place simultaneously.

2. Process according to the preceding claim, **wherein** the at least one emulsion comprises ammonium nitrate and precursors selected from the group comprising: soluble oxidizers, soluble propellants and insoluble precursors in the internal phase or hydrocarbon derivatives and propellant precursors miscible in the external phase, or metals, or mixtures thereof.

3. Process according to any one of the preceding claims, **wherein** the precursors may be fed either

into the internal phase or external phase or subsequently in the emulsification step.

4. Process according to any one of the preceding claims, **wherein** the total amount of precursors is inferior to 70% in weight of the at least one emulsion.

5. Process according to any one of the preceding claims, **wherein** said precursors are selected from the group comprising carbonates, oxides, hydroxides and mixtures thereof.

6. Process according to any one of the preceding claims, **wherein** the at least one emulsion comprises ammonium nitrate dissolved in water.

7. Process according to any one of the preceding claims, **wherein** hydrocarbon derivatives in the external phase comprise at least one of the following compounds: waxes, liquid hydrocarbons or oils, and mixtures thereof.

8. Process according to any one of the preceding claims, **wherein** hydrocarbon derivatives have a viscosity index from 0.004 to 0.020 Pa.s, when liquefied.

9. Process according to any one of the preceding claims, **wherein** the external phase further includes a surfactant compound.

10. Process according to any one of the preceding claims, **wherein** the emulsification step takes place per batch.

11. Process according to any one of the preceding claims, **wherein** said sensitization step is carried out by injecting and homogenizing of an inert gas within the at least one emulsion, or by means of a chemical reaction or by adding solid particles which retain the gas therein.

12. Process according to any one of the preceding claims, **wherein** said the detonation step is carried out by capacitive discharge or laser.

13. Process according to the preceding claim, **wherein** said detonation step further comprises the addition of an ignition emulsion.

14. Process according to any one of the preceding claims, **wherein** the collection step is carried out *in secco*.

15. Process according to any one of the preceding claims, **wherein** said collection step is carried out within a cyclone battery.