We Claim:

1. An immunogenic composition, wherein 0.5 ml of the composition comprises

(i) a diphtheria toxoid, (D) in the range of 10 Lf to 25 Lf, adsorbed onto aluminium salt having percentage adsorption of at least 50%;

(ii) a tetanus toxoid, (T) in the range of 2 Lf to 10 Lf, adsorbed onto aluminium salt having percentage adsorption of at least 40%;

(iii) an inactivated whole cell pertussis antigen (wP) containing inactivated Bordetella pertussis strains 134, 509, 25525 and 6229 in a ratio of 1:1:0.25:0.25, in the range of 12 IOU to 16 IOU;

(iv) a hepatitis B virus surface antigen, (HBsAg) in the range of 7 µg to 15 µg, adsorbed onto aluminium salt having percentage adsorption of at least 70%;

(v) a *Haemophilus influenzae* type b (Hib) capsular saccharide conjugated to Tetanus Toxoid as a carrier protein using CNBr as cyanylating agent, in the range of 7 µg to 13 µg;

(vi) an inactivated polio virus antigen, (IPV) containing IPV antigen type 1 in the range of 1 - 50 DU, Type 2 in the range of 1 - 20 DU or type 3 in the range of 1 - 50 DU, respectively;

(vii) total aluminium content (Al^{3+}) as aluminium phosphate adjuvant phosphate adjuvant in the range of 0.1 mg to 0.5 mg;

(viii) 2-phenoxyethanol as a preservative in the range of 1 mg to 3 mg; and

(ix) NaCl as a dilution medium or buffer in the range of 0.5 % to 1.5 %;

wherein the composition is a fully liquid combination vaccine, showing improved immunogenicity, reduced reactogenicity and improved stability at 2-8°C and room temperature.

2. The immunogenic composition as claimed in claim 1, wherein the IPV antigens are Salk strains selected from the group of Mahoney type 1, MEF Type 2 or Saukett type 3 or Sabin strains selected from the group of Type 1, Type 2 or Type 3.

3. The immunogenic composition as claimed in claim 1, wherein the inactivated whole cell pertussis antigen, the Hib antigen and the inactivated polio virus antigen are not substantially adsorbed on to any adjuvant.

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4. The immunogenic composition as claimed in claim 1, wherein the composition comprises D antigen in an amount of about 10 Lf per 0.5 ml; T antigen in an amount of about 2 Lf per 0.5 ml; wP antigen in an amount of about 12 IOU per 0.5 ml; HBsAg in an amount of about 8 µg per 0.5 ml; Hib antigen in an amount of about 8 µg per 0.5 ml; IPV antigen Salk type 1 in an amount of about 40 DU, Salk Type 2 in an amount of about 8 DU or Salk type 3 in an amount of about 32 DU, respectively, per 0.5 ml; total aluminium content (Al^{3+}) as aluminium phosphate not more than 0.3 mg to 0.5 mg per 0.5 ml

; 2-Phenoxyethanol in an amount of about 2.5 mg per 0.5 ml; sodium chloride in an amount of about 0.9%.

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5. The immunogenic composition as claimed in claim 1, wherein the composition comprises D antigen in an amount of about 20 Lf per 0.5 ml; T antigen in an amount of about 4 Lf per 0.5 ml; wP antigen in an amount of about 14 IOU per 0.5 ml; HBsAg in an amount of about 15 µg per 0.5 ml; Hib antigen in an amount of about 10 µg per 0.5 ml; IPV antigen Salk type 1 in an amount of about 40 DU, Salk Type 2 in an amount of about 8 DU or Salk type 3 in an amount of about 32 DU, respectively, per 0.5 ml; total aluminium content (Al3+) as aluminium phosphate not more than 0.3 mg per 0.5 ml; 2-Phenoxyethanol in an amount of about 2.5 mg per 0.5 ml; sodium chloride in an amount of about 0.9%.

6. The immunogenic composition as claimed in claim 1, wherein the composition comprises D antigen in an amount of about 25 Lf per 0.5 ml; T antigen in an amount of about 10 Lf per 0.5 ml; wP antigen in an amount of about 16 IOU per 0.5 ml; HBsAg in an amount of about 15 µg per 0.5 ml; Hib antigen in an amount of about 13 µg per 0.5 ml; IPV antigen Salk type 1 in an amount of about 40 DU, Salk Type 2 in an amount of about 8 DU or Salk type 3 in an amount of about 32 DU, respectively, per 0.5 ml; total aluminium content (Al3+) as aluminium phosphate not more than 0.3 mg per 0.5 ml; 2-Phenoxyethanol in an amount of about 2.5 mg per 0.5 ml; sodium chloride in an amount of about 0.9%.

7. A process of manufacturing a fully liquid combination vaccine composition showing improved immunogenicity, reduced reactogenicity and improved stability comprising, wherein 0.5 ml of the composition comprises

(i) a diphtheria toxoid, (D) in the range of 10 Lf to 25 Lf, adsorbed onto aluminium salt having percentage adsorption of at least 50%;
(ii) a tetanus toxoid, (T) in the range of 2 Lf to 10 Lf, adsorbed onto aluminium salt having percentage adsorption of at least 40%;

(iii) an inactivated whole cell pertussis antigen, (wP) containing inactivated Bordetella pertussis strains 134, 509, 25525 and 6229 in a ratio of 1:1:0.25:0.25, in the range of 12 IOU to 16 IOU;

(iv) a hepatitis B virus surface antigen, (HBsAg) in the range of 7 µg to 15 µg, adsorbed onto aluminium salt having percentage adsorption of at least 70%;

(v) a *Haemophilus influenzae* type b (Hib) capsular saccharide conjugated to a carrier protein Tetanus Toxoid as a carrier protein using CNBr as cyanylating agent, in the range of 7 µg to 13 µg; and

(vi) an inactivated polio virus antigen, (IPV); containing IPV antigen Salk/Sabin type 1 in the range of 1 - 50 DU, Salk/Sabin Type 2 in the range of 1 - 20 DU or Salk/Sabin type 3 in the range of 1 - 50 DU, respectively;

(vii) total aluminium content (Al^{3+}) as aluminium phosphate adjuvant in the range of 0.1 mg to 0.5 mg;

(viii) 2-phenoxyethanol as a preservative in the range of 1 mg to 6 mg; and

(ix) NaCl as a dilution medium or buffer in the range of 0.5 % to 1.5 %;

the process comprising the steps:

a). Addition of 80% of total Normal saline (NaCl) in a blending vessel / container;

b). Addition of Component - I comprising Diphtheria Toxoid in a blending vessel/container;

c). Addition of Component – II comprising Tetanus Toxoid to Component – I of Step(b) with agitation at room temperature;

d). Addition of inactivated whole cell pertussis antigen to mixture obtained in Step-(c) with agitation at room temperature;

e). Addition of Component – III comprising Hepatitis B surface Antigen to mixture obtained in Step-(d) at room temperature;

f). Addition of Hib Antigen to the mixture obtained in Step-(e) at 6-16°C;

g). Addition of IPV antigen to the mixture obtained in Step-(f) at 6-16 °C;

h). Addition of 2-Phenoxy Ethanol to the mixture obtained in Step-(g) at 6-16 °C;

i). Adjusting pH of the mixture obtained in Step-(g) to 6.0 to 7.0 with Sodium Hydroxide / Sodium Carbonate; and

j).Adding remaining 20% of total normal saline to make up the volume with agitation.

8. The process as claimed in claim 7, wherein the preparation of the Component- I comprises the following steps:

a). Transfer of aluminum phosphate in the container / vessel;

b). Addition of the Diphtheria Toxoid to the container/ vessel of Step-(a);

c). pH adjustment of the mixture obtained in Step-(b) to 4.5 to 5.5 with Acetic Acid / Sodium Hydroxide;

d). Hold the mixture obtained in Step-(c) at 33-37 °C for at least 48 hours:

e). Change temperature to 2-8°C and hold for 7 days:

f). pH adjustment of the mixture obtained in Step-(e) to 5.5 to 6.5 with Sodium Hydroxide / Sodium Carbonate / Trisodium phosphate; and

g). Store Component I obtained in Step-(f) at 2-8 °C till further use.

9. The process as claimed in claim 7, wherein the preparation of the Component- II comprises the following steps:

a). Transfer of aluminum phosphate in the container / Vessel

b). addition of the Tetanus Toxoid to the container/ vessel of Step-(a);

c). pH adjustment of the mixture obtained in Step-(b) to 4.5 to 5.5 with Acetic Acid / Sodium Hydroxide;

d). - Hold the mixture obtained in Step-(c) at 33-37 °C for at least 48 hours:

e) Change temperature to 2-8°C and hold for 7 days:

f). pH adjustment of the mixture obtained in Step-(e) to 5.5 to 6.5 with Sodium Hydroxide / Sodium Carbonate/Trisodium phosphate; and

g). Store Component II obtained in Step-(f) at 2-8°C till further use.

10. The process as claimed in claim 7, wherein the preparation of the Component -III comprises the following steps:

a). Transfer of aluminum phosphate in the container / Vessel

b). addition of the Hepatitis B surface Antigen to the container/ vessel of Step-(a);

c). pH adjustment of the mixture obtained in Step-(b) to 4.5 to 5.5 with Acetic Acid / Sodium Hydroxide

d). - Hold the mixture obtained in Step-(c) at 22-25 °C for at least 20-28 hours:

e). pH adjustment of the mixture obtained in Step-(d) to 5.8 to 6.8 with Sodium Hydroxide / Sodium Carbonate/ Trisodium phosphate; and

f). Store Component III obtained in Step-(e) at 2-8°C till further use.

11. The process as claimed in claim 7, wherein the preparation of the inactivated whole cell pertussis antigen comprises the following steps:

a). inactivation at 56°C for 10 – 15 minutes in presence of formaldehyde of *Bordetella pertussis* strains 134;

b). inactivation at 56°C for 10 – 15 minutes in presence of formaldehyde of *Bordetella pertussis* strains 509;

c). inactivation at 56°C for 10 – 15 minutes in presence of formaldehyde of *Bordetella pertussis* strains 25525 and 6229;

d). inactivation at 56°C for 10 – 15 minutes in presence of formaldehyde of *Bordetella pertussis strains 6229;*

e). subsequently mixing inactivated *Bordetella pertussis strains 134, 509, 25525 and 6229* obtained in Steps (a), (b), (c) and (d), respectively *in a ratio of 1:1:0.25:0.25; and*

f). optionally adsorbed onto aluminium based adjuvant.

wherein the process is devoid of thimerosal and inactivated whole cell pertussis antigen remains non-clumpy and homogeneous thereby leading to reduced reactogenicity and potency more than 4.5 IU/dose, for a longer duration.

12. The process as claimed in claim 7, wherein the preparation of the Hib antigen comprises the steps of:

a). Fermentation of *Haemophilus influenzae Type b;*

b). Inactivation of Haemophilus influenzae Type b obtained in Step-(a) at 37 °C for 2 hours in presence of 0.1% formaldehyde

c). Purification of Hib polyribosylribitol phosphate (PRP) polysaccharide obtained in Step-(b);

d). Conjugation of purified product of Step-(c) to tetanus toxoid (TT) using a Cyanogen Bromide cyanylation conjugation chemistry in presence of adipic acid dihydrazide (ADH) linker;

e). purification of conjugate of Step-(d);

f). filtration of purified conjugate preferably of Step-(e) through 0.22 μm filter.

wherein the percentage free PRP is no more than 5% in the total purified Hib bulk conjugate.