Patent Claims

1. Phosphor mixture comprising three or more silicate phosphors of the formula I
$Ba_wSr_xCa_ySiO_4$: zEu (I),
in which all indices w, x, y and z are independent of one another, with the condition that within one compound the indices w, x, y and z add up to 2 (w+x+y+z = 2),
and in which one or more silicate phosphors having at least one emission maximum at a wavelength between 508 nm and 550 nm emit green light, one or more silicate phosphors having at least one emission maximum at a wavelength between 551 nm and 585 nm emit yellow light and one or more silicate phosphors having at least one emission maximum at a wavelength between 586 nm and 625 nm emit orange light and in which the weight ratio of green phosphor to yellow phosphor to orange phosphor is 1.8 - 4.0 : 0.1 - 4.0 : 0.8 - 3.0.

2. The phosphor mixture of Claim 1, in which the weight ratio of green phosphor to yellow phosphor to orange phosphor is 1.8 - 2.5 : 0.8 - 1.3 : 1.8 - 2.5.

3. Phosphor mixture comprising three or more silicate phosphors of the formula I
$Ba_wSr_xCa_ySiO_4$: zEu (I),
in which all indices w, x, y and z are independent of one another, with the condition that within one compound the indices w, x, y and z add up to 2 (w+x+y+z = 2), and in which the three or more silicate phosphors comprise a green-emitting phosphor, a yellow-emitting phosphor and an orange-emitting phosphor and in which

- the green-emitting phosphor is a silicate phosphor having at least one emission maximum at a wavelength between 508 nm and 550 nm and is $Ba_{w1}Sr_{x1}$ SiO_4: z1 Eu, where w1 = 0.80 to 1.85; x1 = 0.10 to 1.25 and z1 = 0.05 to 0.20,
- the yellow-emitting phosphor is a silicate phosphor having at least one emission maximum at a wavelength between 551 nm and 585 nm and is $Ba_{w2}Sr_{x2}Ca_{y2}SiO_4$: z2 Eu, where w2 = 0.10 to 0.80; x2 = 1.0 to 1.80; y2 = 0.0 to 0.2 and z2 = 0.05 to 0.20,
- the orange-emitting phosphor is a silicate phosphor having at least one emission maximum at a wavelength between 586 nm and 625 nm and is $Ba_{w3}Sr_{x3}Ca_{y3}SiO_4$: z3Eu, where w3 = 0.03 to 0.10; x3 = 0.90 to 1.50; y3 = 0.20 to 0.80 and z3 = 0.05 to 0.20.

4. Light source which comprises an indium aluminium gallium nitride semiconductor and three or more silicate phosphors comprising $Ba_wSr_xCa_ySiO_4$: zEu, in which all indices w, x, y and z are independent of one another, with the condition that within one compound the indices w, x, y and z add up to 2 (w+x+y+z = 2), and in which one or more silicate phosphors having at least one emission maximum at a wavelength between 508 nm and 550 nm emit

green light, one or more silicate phosphors having at least one emission maximum at a wavelength between 551 nm and 585 nm emit yellow light and one or more silicate phosphors having at least one emission maximum at a wavelength between 586 nm and 625 nm emit orange light, characterised in that the weight ratio of green phosphor to yellow phosphor to orange phosphor is 1.8 to 4.0 : 0.1 to 4.0 : 0.8 to 3.0.

5. Light source according to Claim 4, characterised in that the weight ratio of green phosphor to yellow phosphor to orange phosphor is 1.8 to 2.5 : 0.8 to 1.3 : 1.8 to 2.5.

6. Backlighting system having at least one light source according to Claims 4 or 5.

7. Liquid-crystal display (LCD) fitted with one or more backlighting systems according to Claim 6.

8. Electronic or electro-optical device comprising a phosphor mixture according to one or more of Claims 1 to 3.

9. Process for the preparation of a phosphor mixture according to one or more of Claims 1 to 3 in which a first silicate phosphor is mixed with one or more further phosphors.

Patent Claims

1. Phosphor mixture comprising three or more silicate phosphors of the formula I
$Ba_wSr_xCa_ySiO_4$: zEu (I),
in which all indices w, x, y and z are independent of one another, with the condition that within one compound the indices w, x, y and z add up to 2 (w+x+y+z = 2),
and in which three or more silicate phosphors comprise a green-emitting phosphor, a yellow-emitting phosphor and an orange-emitting phosphor and in which

- the green-emitting phosphor has at least one emission maximum at a wavelength between 508 nm and 550 nm and is $Ba_{w1}Sr_{x1}$ SiO_4: z1 Eu, where w1 = 0.80 to 1.85; x1 = 0.10 to 1.25 and z1 = 0.05 to 0.20;
- the yellow-emitting phosphor has at least one emission maximum at a wavelength between 551 nm and 585 nm and is $Ba_{w2}Sr_{x2}Ca_{y2}SiO_4$: z2 Eu, where w2 = 0.10 to 0.80; x2 = 1.0 to 1.80; y2 = 0.0 to 0.2 and z2 = 0.05 to 0.20;
- the orange-emitting phosphor has at least one emission maximum at a wavelength between 586 nm and 625 nm and is $Ba_{w3}Sr_{x3}Ca_{y3}SiO_4$: z3 Eu, where w3 = 0.03 to 0.10; x3 = 0.90 to 1.50; y3 = 0.20 to 0.80 and z3 = 0.05 to 0.20;

in which the weight ratio of green phosphor to yellow phosphor to orange phosphor is 1.8 - 2.5 : 0.8 - 1.3 : 1.8 - 2.5.

2. Light source which comprises an indium aluminium gallium nitride semiconductor and three or more silicate phosphors comprising $Ba_wSr_xCa_ySiO_4$: zEu, in which all indices w, x, y and z are independent of one another, with the condition that within one compound the indices w, x, y and z add up to 2 (w+x+y+z = 2), and in which one or more silicate phosphors having at least one emission maximum at a wavelength between 508 nm and 550 nm emit green light, one or more silicate phosphors having at least one emission maximum at a wavelength between 551 nm and 585 nm emit yellow light and one or more silicate phosphors having at least one emission maximum at a wavelength between 586 nm and 625 nm emit orange light, characterised in that the weight ratio of green phosphor to yellow phosphor to orange phosphor is 1.8 to 4.0 : 0.1 to 4.0 : 0.8 to 3.0.

3. Light source according to Claim 2, characterised in that the weight ratio of green phosphor to yellow phosphor to orange phosphor is 1.8 to 2.5 : 0.8 to 1.3 : 1.8 to 2.5.

4. Backlighting system having at least one light source according to Claim 2 or Claim 3.

5. Liquid-crystal display (LCD) fitted with one or more backlighting systems according to

Claim 4.

6. Electronic or electro-optical device comprising a phosphor mixture according to Claim 1.

7. Process for the preparation of a phosphor mixture according to Claim 1, in which a first silicate phosphor is mixed with one or more further phosphors.