for the oxidation-reduction reaction of iron and sulfur, in the proportion of total tin from 0.001 to 5.0%. The glasses of this patent have a solar transmittance T_e at most 65%, a light transmittance T_v (by illuminant A, 2° visual field) at least 60%, for a 4 mm thickness glass, as defined in JIS R3106 (1998).

[0035] It would be advantageous to provide a soda-lime-silica glass with high visible light transmittance. Further, it would be advantageous to provide methods for making low iron soda-lime-silica glasses that can be used regardless of the type of heating system or furnace used to melt the glass batch materials and to eliminate the limitations associated with the same.

SUMMARY

[0036] According to the present disclosure, there is provided a glass or a glass sheet having a soda-lime-silica glass composition with a high visible light transmittance (L_{tC}) of at least 89%; with a dominant wavelength (DW) from about 490 to 505 nanometers and purity (Pe) of no more than 1% for control thickness of 5.66 mm. The glass composition comprising from 0.02 to 0.06 wt. % of total iron oxide (Fe_2O_3); from 0.006 to 0.02 wt. % of FeO (ferrous), from about 0.30 to 0.55 of redox (FeO/Fe_2O_3); from about 0.3 to 10 ppm of Cr_2O_3; from about 50 to 500 ppm of TiO_2; from about 10 to 500 ppm of SnO_2; and a critical amount from about 0.10 to 0.25 wt. % of SO_3.

[0037] The main objective in the present disclosure is to offer a clear glass composition with high visible light transmittance.

[0038] Another objective of the present disclosure is to offer a low-cost clear glass. This can be achieved by using low iron raw materials, such as low iron dolomite, and a mixture of clear and low iron cullet to accomplish the proper balance of colorants concentrations such as Cr_2O_3, TiO_2 and Fe_2O_3. Another option to achieve the desired properties is by using a partial substitution of low iron raw materials by regular raw materials except for low iron dolomite, the colorant concentrations such as Cr_2O_3, TiO_2 and Fe_2O_3 can be achieve by the use of regular sand in which these oxides are present as impurities.

[0038a] In one aspect, the present disclosure provides a method of making the clear glass using a conventional float non-vacuum glass system, the method comprising:

providing a glass batch having ingredients to make the glass having the basic soda-lime-silica glass composition and colorants;

melting the glass batch to provide a pool of molten glass;

flowing the molten glass onto a molten tin bath;

moving the molten glass on the surface of the molten tin bath, while controllably cooling the glass and applying forces to the glass to provide a glass of a desired thickness; and

removing the glass from the molten tin bath,

wherein the glass batch comprises between 5 to 20 wt. % of a low iron dolomite wherein the low iron dolomite comprises a total iron content, expressed as Fe_2O_3 content, of less than 0.02 wt. %, wherein the low iron dolomite comprises a total CaO content of between 30 and 35 wt. %, and wherein the low iron dolomite comprises an MgO content of between 15 and 25 wt. %, and wherein the glass has a redox ratio (as expressed as FeO/Fe_2O_3) in the range of 0.30 to 0.55.

[0039] Further non-limiting examples are set forth and described in the following clauses.

[0040] Clause 1: A clear glass having a soda-lime-silica glass composition comprising: total iron oxide (Fe_2O_3) of 0.02 to 0.06 wt. %;, ferrous (FeO) from 0.006 to 0.02 wt. %; redox (FeO/Fe_2O_3) from about 0.30 to 0.55 wt. %; Cr_2O_3 from about 0.3 to 10 ppm; TiO_2 from about 50 to 500 ppm; SnO_2 from about 10 to 500 ppm; and SO_3 from about 0.10 to 0.25 wt. %.

THE INVENTION CLAIMED IS

1. A method of making the clear glass using a conventional float non-vacuum glass system, the method comprising:

providing a glass batch having ingredients to make the glass having the basic soda-lime-silica glass composition and colorants;

melting the glass batch to provide a pool of molten glass;

flowing the molten glass onto a molten tin bath;

moving the molten glass on the surface of the molten tin bath, while controllably cooling the glass and applying forces to the glass to provide a glass of a desired thickness; and

removing the glass from the molten tin bath,

wherein the glass batch comprises between 5 to 20 wt. % of a low iron dolomite wherein the low iron dolomite comprises a total iron content, expressed as Fe_2O_3 content, of less than 0.02 wt. %, wherein the low iron dolomite comprises a total CaO content of between 30 and 35 wt. %, and wherein the low iron dolomite comprises an MgO content of between 15 and 25 wt. %, and wherein the glass has a redox ratio (as expressed as FeO/Fe_2O_3) in the range of 0.30 to 0.55.

2. The method of claim 1, wherein the conventional float non-vacuum glass system contains a furnace, the combustion of the furnace produced by a firing of air and/or gas, or by a firing of oxygen/gas.

3. The method of claim 2, wherein the redox ratio in the glass in the range of 0.30 to 0.55 is achieved by adjusting the amount of oxygen and air in the combustion gas.