which will have superior mechanical and corrosion properties than any product available. The alloy of the present invention is useful in the following industries: pulp and paper, petrochemical, oil field, aerospace, pharmaceutical, cryogenics, electric power, medical, armed forces (armor for e.g., tanks, armored personal carriers, amphibious vehicles, body armor), railroad, automotive, nuclear and superconductivity, thermal spray and others.

We claim:

1. A high nitrogen stainless steel alloy which is substantially free of stable nitride and sigma phases, prepared by nitrogen gas atomization and consolidation, without solution treating and quenching said stainless steel.

2. The stainless steel alloy of claim **1**, comprising about 27 to about 30% by weight Cr, about 1.5% to 4.0 by weight Mo, Mn is present and is present in an amount up to about 15% by weight, at least about 8% by weight Ni, about 0.8% to about 0.97 % by weight N and the balance being Fe.

3. The stainless steel alloy of claim **2**, comprising 27.4% to 29.9% by weight Cr, 1.9% to 2.0% by weight Mo, 6.0% to 15% by weight Mn, 12% to 16% by weight Ni, 0.8 to 0.95% by weight N and 39% to 47% by weight Fe.

4. The stainless steel alloy of claim **2**, wherein the Mn is present in an amount less than 10% by weight.

5. The stainless steel alloy of claim **2**, wherein the Mn is present in an amount between 6 and 15% by weight.

6. The stainless steel alloy of claim **2**, wherein the Cr is present in an amount between 27.4% and 29.9% by weight.

7. The stainless steel alloy of claim **2**, wherein Ni is present in an amount between 10 and 16% by weight.

8. The stainless steel alloy of claim **7**, wherein the Ni is present in an amount between 12 and 16% by weight.

9. The stainless steel alloy of claim **2**, wherein Mo is present in an amount between 1.7 and 2.3% by weight.

10. The stainless steel alloy of claim **9**, wherein the Mo is present in an amount at or about 2% weight.

11. The stainless steel alloy of claim **2**, further comprising up to 3% by weight W.

12. A process for preparing the stainless steel alloy of claim **1**, comprising melting a mixture of metals under a nitrogen atmosphere, atomizing the melted mixture of metals with nitrogen gas to form an alloy powder containing nitrogen, and consolidating the alloy powder.

13. The process of claim **12**, wherein the consolidating is performed using a hot isostatic press.

14. A process for preparing the stainless steel alloy of claim **2**, which is substantially free of stable nitrides and sigma (σ) phases, without solution treating and quenching steps to remove stable nitrides and sigma (σ) phases, said process comprising melting a mixture of metals, atomizing the melted mixture of metals with nitrogen gas to form an alloy powder containing nitrogen, and consolidating the alloy powder, thereby forming the stainless steel composition of claim **2**.

15. An article comprising the stainless steel alloy of claim **1**.

16. The article according to claim **15**, which is a biomedical device.

17. The article according to claim **16**, which is an orthopedic implant.

18. The article according to claim **15**, which is armor.

19. A stainless steel alloy powder for preparing a stainless steel alloy which is substantially free of stable nitrides and sigma (σ) phases without solution treating and quenching steps to remove stable nitrides and sigma (σ) phases, comprising about 27 to about 30% by weight Cr, about 1.5 to about 4.0% by weight Mo, Mn is present and is in an amount up to about 15% by weight, at least about 8% by weight Ni, and about 0.8 to about 0.97% by weight N, with the balance being Fe.

20. The stainless steel alloy powder of claim **19**, comprising 27.4% to 29.9% by weight Cr, at or about 2.0% by weight Mo, 6.0% to 15% by weight Mn, 12% to 16% by weight Ni, 0.8 to 0.95% by weight N and 39% to 47% by weight Fe.

21. An article comprising the stainless steel alloy of claim **2**.

22. The article according to claim **21**, which is a biomedical device.

23. The article according to claim **22**, which is an orthopedic implant.

24. The article according to claim **21**, which is armor.

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