What is claimed is:

1. An oxidation-resistant heat-resistant alloy comprising by mass percentage: 2.5%-6% of Al, 30%-50% of Ni, 2%-8% of W, 0.01%-0.4% of Hf, 24%-30% of Cr, 0.3%-0.55% of C, 0.01%-0.2% of Ti, 0.01%-0.2% of Zr, 0.01%-0.2% of Y, 0.01%-0.2% of V; N<0.05%, O<0.003%, S<0.003% and Si<0.5%, the balance being Fe and inevitable impurities,
wherein merely one of Ti and V is comprised and wherein in an oxidizing atmosphere of 1000-1200℃, no less than 90% of an area of an oxidation film that is formed at a surface of the alloy is an Al_2O_3 film.

2. The oxidation-resistant heat-resistant alloy according to claim 1, wherein the alloy comprises: 3.3%-5.5% of Al, and 34%-46% of Ni.

3. The oxidation-resistant heat-resistant alloy according to claims 1 or 2, wherein the alloy comprises: 3%-6% of W.

4. The oxidation-resistant heat-resistant alloy according to any one of claims 1-3, wherein the alloy comprises: 0.01%-0.06% of Y.

5. A method for preparing an oxidation-resistant heat-resistant alloy, wherein the method is for preparing the alloy according to any one of claims 1-4, and comprises the following steps:

Step 1: melting carbon and the inactive elements, to obtain a molten steel after being completely molten;

Step 2: heating up the molten steel, and refining;

Step 3: adding a mixed rare earth;

Step 4: adding a molten slag; and

Step 5: introducing an inert gas into a casting runner, placing active elements

such as aluminum, hafnium, titanium, zirconium and yttrium in the casting runner, heating up, pouring the molten steel into the casting runner, and introducing the molten steel into a tundish to cast,

wherein a temperature of the refining in Step 2 is not less than 1640℃,

wherein part of the carbon is firstly added in Step 1, and remaining carbon is then added in Step 2 when the molten steel has been heated to no less than 1640℃,

wherein the additional mount of the mixed rare earth is 0.05% - 0.25% of the mass of the molten steel, wherein the slag contains CaO, wherein the inert gas is argon, the pressure of the argon is 0.15-0.3MPa, and the flow rate is 1-5L/min.