**Description:**

The aluminothermic reduction process (ATR) has efficient application in several metallurgical melting processes for production of alloys and ferroalloys with usage of the oxidized raw materials including the secondary ones as the basic charge components. Generally it starts with application of igniting mechanism when all of the reacting components are in a solid state after their mixing. The new approach in arrangement of the specific ATR process is being developed for the last several years in Ukraine. It is based on generation of liquid oxides with their following pouring into a reactor before ATR starts. It makes interaction between reacting phases more intimate. The perfect phase separation takes place at the end of the process. A forming upper slag layer arranges protection of a melt and prevents it from getting in of the additional gases. The produced alloy has virtually the same rate of purity as any vacuum melted alloy. The generation of the oxidized melt gives an option to adjust its composition by reduction of the definite part of oxides at any need. The representative number of the correspondent melts with application of the electroslag crucible remelting furnace for smelting of oxides in a form of ilmenite for ferrotitanium production was carried out. The melts were done without adding of expansive titanium metallic compounds according to the current ATR technology with a solid start. As the result the produced ferroalloy has lower content of the dissolved gases (%, 0.8 O and 0.001 N) then that is produced by the traditional ATR (%, 2. O and 0.5 N) or even from the metallic compounds (%, 2.O and 0.12 N).

**Innovative aspect and main advantages:**

None booster is needed for maintaining self-consistency of ATR, Since the major part of the charge is in molten state at the very beginning. From the other part the oxide phase essentially gets free of foreign gases during its smelting operation. The above two features prevent risks of explosion at the ATR process especially at its most dangerous starting phase. So the safety of the ATR process is significantly improved as well as the safety of handling charge materials since the explosive ones are not used in the process. The signif cant saving of reductant that reacts for heating of a melt is obtained at the same time. Moreover the higher ratio between Ti and Al can be received. There is no need for using of expansive powdery Al and metallic scrap as the charge materials. So the cost of the non-traditional ATR production is 10% less. At the same time the produced ferroalloy has virtually the equal rate of purity as any vacuum melted alloy. So the alloyed steels manufactured with application of this ferroalloy are also very clean without additional refining.

**Areas of Application:**

The approach should be used in traditional technologies of ferroalloys or nickel-base alloys production where ATR processes are currently applied. It is also applicable in manufacturing of several specialty alloys with sufficient content of aluminum, for example the Gamma– TAI base alloys. In this case the metallic components are partially or completely should be replaced in the charge by their oxides.

**Stage of Development:**

The approach has been successfully tested in the laboratory and pilot plant conditions for systems with Ti oxides. It is protected by UA Patent 76918 15.09.2006.

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**Contact details:**

Dr. Eugene A. Zhidkov  
Head of Department  
Physico-Technological Institute of Metals and Alloys of NAS of Ukraine  
34/1 Vernadsky Ave.  
Kiev-142, 03680, Ukraine  
Phone: +38044- 424-6057  
Fax: +38044- 424-1210  
E-mail: vlad@visti.com