

Title (en)

Process for regulating the alumina content of bath in cells for producing aluminium

Title (de)

Verfahren zur Regulierung des Tonerdegehalts im Bad einer Elektrolysezelle zur Aluminiumherstellung

Title (fr)

Procédé de régulation de la teneur en alumine du bain des cuves d'électrolyse pour la production d'aluminium

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Application

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Priority

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Abstract (en)

Regulating the alumina content in the cryolite-based bath of an electrolytic aluminium production cell comprises varying the alumina supply rate, as a function of the value and change of cell resistance (R) calculated from the cell terminal potential difference, in alternate phases of under-supply with slow rates (CL) of alumina introduction (phase 1) and phases of over-supply with rapid (CR) or very rapid (CUR) rates of alumina introduction (phase 2) w.r.t. a reference or theoretical rate (CT) corresponding to the mean theoretical alumina consumption of the cell. Each regulation cycle of duration (T) comprises: (a), at the end of each regulation cycle 'i', calculating the average resistance 'R(i)', the resistance change rate or slope 'P(i)', the rate of change of the resistance slope or curve 'C(i)' and a forecasted value of the resistance slope at the instant 't(i+1)' or the extrapolated slope 'PX(i)' (= P(i) + C(i) x T) which is an estimate of the future resistance slope 'P(i+1)' at the end of regulation cycle 'i+1'; (b) comparing the value 'R(i)' with a target value 'Ro' to ascertain whether the anodes require displacement for reducing or for increasing the anode-to-metal distance; and (c) regulating the alumina supply as a function of the values of the slope 'P(i)', the curve 'C(i)' and the extrapolated slope 'PX(i)' to compensate anticipated alumina content changes.

Abstract (fr)

Procédé de régulation de la teneur en alumine du bain d'une cuve de production d'aluminium par électrolyse d'alumine dissoute dans un sel fondu à base de cryolithe, consistant à alterner des phases de sous-alimentation en alumine et des phases de suralimentation en alumine par rapport à un régime de consommation théorique moyenne d'alumine de la cuve en fonction des valeurs calculées au terme de chaque cycle i de régulation de durée T, de la résistance moyenne R(i) mesurée aux bornes de la cuve, de la vitesse d'évolution de cette résistance ou pente de résistance P(i), de la vitesse d'évolution de la pente de résistance ou courbure C(i) et de la pente extrapolée PX(i)=P(i) + C(i) x T, qui sont comparées respectivement à des valeurs de référence Po, Co et PXo permettant de moduler, selon un algorithme de régulation approprié, la teneur en alumine du bain dans une plage de concentration très étroite comprise entre 1,5 et 3,5%. <IMAGE>

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Citation (search report)

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