

Aluminium Extraction: Answers

Version A

1. (a) Many possible answers including:
- No cheap electricity supply – eg hydroelectric
 - Cheaper labour costs
 - Closer to supply of ore, thus reducing transport costs
 - Less rigid pollution laws [1]
- (b) Many possible answers including
- Deep water port for importing alumina and cryolite
 - Electricity supply considerations
 - Good links to users by road, rail and sea [2]
- (c) (i) 27 g is produced by 3 F [1]
- 1,000,000 g is produced by:
- $$\frac{3 \times 1,000,000 \text{ F}}{27} \quad [1]$$
- $$= 111,111 \text{ F} \quad [1]$$
- (ii) Number of coulombs = $157,000 \times 24 \times 60 \times 60 \times 308 \text{ C}$ [1]
- $$\text{Number of faradays} = \frac{157,000 \times 24 \times 60 \times 60 \times 308 \text{ F}}{96,000}$$
- $$= 43,520,400 \text{ F} \quad [1]$$
- Number of tonnes = $\frac{43,520,400 \text{ tonnes}}{111,111}$
- $$= 391.7 \text{ tonnes} \quad [1]$$

Aluminium extraction: Answers

Version B

1. (a) Many possible answers including
- No cheap electricity supply – eg hydroelectric
 - Cheaper labour costs
 - Closer to supply of ore reducing transport costs
 - Less rigid pollution laws
- [1]
- (b) Many possible answers including
- Deep water port for importing alumina and cryolite
 - Electricity supply considerations
 - Good links to users by road, rail and sea
- [2]
- (c) (i) 3
- [1]
- $$\frac{3 \times 1,000,000}{27} \text{ F} = 111,111 \text{ F}$$
- [2]
- (ii) Number of coulombs = $157,000 \times 24 \times 60 \times 60 \times 308 \text{ C}$
- [1]
- $$\text{Number of faradays} = \frac{157,000 \times 24 \times 60 \times 60 \times 308}{96,000} \text{ F}$$
- $$= 43,520,400 \text{ F}$$
- [1]
- $$\text{Number of tonnes} = \frac{43,520,400}{111,111} \text{ tonnes}$$
- $$= 391.7 \text{ tonnes}$$
- [1]