



A study of factors influencing the kinetics of copper cementation during atmospheric leaching of converter matte

by R.M. Lamya* and L. Lorenzen*

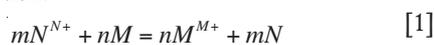
Synopsis

The kinetics of copper cementation during atmosphere leaching of a Ni-Cu matte in $\text{CuSO}_4\text{-H}_2\text{SO}_4$ solution was studied as a function of initial copper ion concentration, initial acid concentration, temperature, stirring rate, particle size distribution and pulp density. It was found that all these process variables influenced the rate of cementation. A two-stage rate of reaction was observed in most of the experiments, with the rate of cementation in the initial stage being slower than that of the subsequent second stage. The increased rate of cementation in the second stage was attributed to the enhancing effect of the surface deposit.

The cementation process was found to take place by two different rate-controlling mechanisms. At a temperature range of 50–70°C, an activation energy of 74.6 kJ/mol was obtained, indicating a surface reaction controlled process. At higher temperatures (70–80°C) a lower value of activation energy was observed (18.2 kJ/mol), indicative of a process controlled by diffusion through surface layers. The structural characteristics of the cemented deposit could not be determined in the investigated system where the deposit was mixed with the leach solid residue.

Introduction

Cementation is defined as an electrochemical reaction involving the precipitation of a more noble metal ion from solution by another more electropositive metal according to the overall reaction:

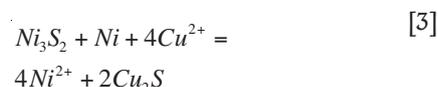
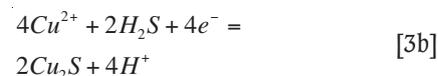
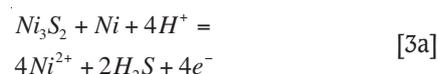


where N is the noble metal and M is the precipitant. Cementation is an important reaction in hydrometallurgical processes, for example it can be used to recover copper from acid leach solutions and gold from cyanide leach solutions. Many studies have been conducted on the process of cementation of copper, using precipitants such as Fe, Al, and Ni, to understand the mechanisms and kinetics involved. Nadkarni *et al.*¹ carried out a study of copper precipitation on iron using a rotating disc. They correlated the rate of cementation with such parameters as copper and hydrogen ion concentration, flowrate, geometric factors and temperature. Annamalai and Murr²

conducted a similar study to investigate the influence of deposit morphology on the kinetics of copper cementation on pure iron. Investigations on copper cementation on pure aluminum disc include kinetic studies carried out by Annamalai and Hiskey³, Mackinnon and Ingraham⁴, and Donmez *et al.*⁵. Mackinnon *et al.*⁶ studied copper cementation on pure nickel and nickel-copper alloy discs. According to their results, copper cementation on the Ni-Cu alloy was unsuccessful, and this was attributed to a lower potential difference between the copper solution and the surface of the nickel-copper alloy. However, satisfactory results were obtained in the present study in which the precipitant was also the nickel metal in the form of Ni-Cu alloy within the sulphide matte. Copper cementation reaction on a nickel precipitant can be represented by Equation [2]:



During the leaching of the Ni-Cu matte some of the aqueous copper was found to precipitate as Cu_2S due to the presence of H_2S , which was generated during the leaching process, according to the following reactions:



where Equation [3] represents the overall Reaction of [3a] and [3b].

However, it was found that only about 30 per cent of the aqueous copper precipitated as

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Cu₂S. It was therefore assumed that Reaction [3] did not have a significant effect on the overall cementation process, and was not accounted for in the analysis of the results.

The kinetics of the cementation reaction were evaluated by measuring the rate of decrease of copper concentration in the solutions, as a result of precipitation onto the suspended particles of known surface area. Cementation reactions are first order processes with respect to the noble metal. The reactions are found to obey the first order kinetic law, in which data fit a first order rate equation. The rate of copper cementation onto Ni–Cu matte can be represented by the following first order rate equation:

$$\frac{d[Cu^{2+}]}{dt} = -KA \frac{[Cu^{2+}]}{V} \quad [4]$$

By integration and rearrangement of Equation [4] one can obtain the following equation:

$$\log \left[\frac{[Cu^{2+}]_t}{[Cu^{2+}]_0} \right] = - \frac{KA t}{2.303V} \quad [5]$$

where [Cu²⁺]_t = copper concentration at time *t* (g/l)
 [Cu²⁺]₀ = initial copper concentration at *t* = 0 (g/l)
K = Cementation rate constant (cm/s)
V = Volume of solution (cm³)
A = Surface area of matte particles (cm²)
t = reaction time (s)

A plot of log[Cu²⁺]_t/[Cu²⁺]₀ Vs time would yield a straight line with a slope equal to -*KA*/2.303*V*, from which the cementation rate constant or mass transfer coefficient (cms⁻¹) can be determined.

Equation [5] shows that the rate of cementation is also a function of the depositing surface area (*A*), on which the copper ions are reduced and precipitated. At various reaction conditions the morphology of the deposits has been reported to be different (Annamalai and Hiskey³, and Annamalai and Murr²). This results in a change in the surface roughness and hence in the effective surface area of the deposit, which may change the mass transfer conditions within the boundary layer. The rate of cementation is, therefore, a function of all parameters that influence the morphology of the deposit and can be accelerated or retarded. Most cementation processes proceed through two distinct kinetic regions, namely an initial slow period followed by a final enhanced period where the cementation rate is much higher. The enhanced rate of cementation is attributed to the enhancing effect of the surface deposit. Annamalai and Murr² explained the enhancement in terms of attaining a critical deposit mass, which effectively increases the cathodic surface area, and alters the diffusion boundary layer by increased surface roughness. While the two-step mechanism was typical for most experiments in this study, it did not appear in a few cases in which the entire rate was slow.

This study was conducted to investigate the effect of process parameters on the cementation kinetics of copper onto the Ni–Cu particles during the leaching of a converter matte in order to improve understanding of the process. The values of the parameters investigated were close to those found in the commercial plant where the matte was obtained. The parameters investigated were initial copper concentration, initial free acid of leaching solution, temperature, stirring rate, pulp density and particle size distribution.

Experimental

Materials

The material used in this study was a Ni–Cu converter matte with the following chemical composition: 47 per cent nickel, 30 per cent copper, 20.7 per cent sulphur and small amounts of iron and cobalt. The principal phases present in the matte were heazlewoodite (Ni₃S₂), chalcocite (Cu₂S), djurleite (Cu_{1.9}S) and nickel alloy. Leaching solution was acidic copper sulphate solution (spent electrolyte) from a copper tankhouse with the following chemical composition: 24.6 g/l Ni, 25 g/l Cu, 0.7 g/l Fe, 0.2 g/l Co and 90 g/l H₂SO₄. The as-received matte was ground to 50 per cent -45 μm. A portion of the matte was screened in three different size fractions (-300+150, -106+45, -45) which were used to investigate the effect of particle size on the rate of copper cementation. The specific surface area of the matte powder was determined by the BET method.

Experimental procedure

The leaching tests were performed in a mechanically stirred three-litre stainless steel vessel provided with a cover and fitted with an overhead stirrer, a thermometer and a pH electrode. The set-up was then placed in a water bath with temperature control. The parameters investigated and their values are presented in Table I.

A typical experimental procedure was as follows: a predetermined quantity of the leaching solution was added to the leaching vessel and heated to the desired temperature. Then an appropriate quantity of the matte was added and the stirrer was set to the required stirring rate. At predetermined time intervals samples were taken and immediately filtered.

Chemical analysis and mineralogical studies

The solution samples were analysed for copper using inductively coupled plasma (ICP). Determination of the structural characteristics of the solid samples was done by means of a TOPCON ABT60 scanning electron microscope (SEM) equipped with an energy-dispersive X-ray (EDX) analyser.

Results and discussion

Cementation mechanism

The mechanism by which the overall cementation reaction at the solid-liquid interface can occur is generally considered to

Table I

Experimental leaching conditions

Variable	Values investigated
Initial copper concentration (g/l)	25, 36, 48
Initial H ₂ SO ₄ concentration (g/l)	90, 110, 125
Temperature (°C)	50, 60, 70, 80
Stirring rate (rpm)	145, 205, 400
Particle size (μm)	-300+150, -106+45, -45
Pulp density (kg/l)	1.6, 1.7, 1.75

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go through a number of steps. For cementation of aqueous copper ions onto solid Ni-Cu matte particles, the steps involved are:

- diffusion of Cu^{2+} ions to the solid matte surface
- adsorption of the Cu^{2+} onto the surface
- chemical reaction at the surface
- desorption of Ni^{2+} from the matte surface, and
- diffusion of Ni^{2+} away from the surface.

Any one of the above steps may be rate controlling. Diffusion of the Cu^{2+} ions through the bulk solution may be eliminated by sufficiently increasing the stirring rate. However, diffusion through a boundary layer could still be the rate-controlling step.

The kinetics of copper cementation onto the Ni-Cu matte were analysed using the first-order rate law shown in Equation [5]. The cementation reaction can be seen as consisting of two stages: the initial period of reaction (stage 1), and the subsequent period (stage 2). Stage 1 of the reaction is represented by the initial straight line portion of the $\log[\text{Cu}^{2+}]_t/[\text{Cu}^{2+}]_0$ Vs time plot, and stage 2 is represented by the subsequent straight line of the graph (see Figure 3). It can be seen that each of the two stages on the graph has a different slope, and hence different value of the rate constant (K). However, due to the fact that no geometric correction was used for the change in the surface area of the matte during the reaction period, only the rate constant for the first stage was determined in all the tests. Thus K refers to the first stage rate constant in the present study. It should be noted that lower values of the rate constants (K) were obtained in the present study (values ranged from 0.004 to 0.028×10^{-3} cm/s) in comparison with those obtained by MacKinnon *et al.*⁶, Annamalai and Hiskey³, MacKinnon and Ingraham⁴, and Nadkarni *et al.*¹. MacKinnon *et al.*⁶ obtained rate constant values of more than 0.2×10^2 cm/s in a study of copper cementation on nickel discs using the rotating disc method. The comparatively low rate of cementation obtained in the present study was probably due to the fact that the total surface area of the matte, which was used in the calculation of the K values, was much larger than the surface area of nickel particles in the matte on which the cementation reaction takes place. In addition, much higher pulp densities and solution concentrations were employed in this study.

The activation energy of the reaction was determined from the Arrhenius equation (Equation [6]).

$$K = Ae^{-E/RT} \quad [6]$$

where K is the reaction rate constant, A is called the frequency factor, R is the gas constant and E is the activation energy of the reaction.

Effect of initial copper concentration

The effect of varying the initial Cu^{2+} ion concentration of solution on the kinetics of copper cementation onto suspended particles of the matte was investigated at three different values, namely 25, 36 and 48 g/lCu. The other variables were kept constant. Figure 1 shows the first order kinetic plot of $\log([\text{Cu}^{2+}]_t/[\text{Cu}^{2+}]_0)$ Vs time, and Figure 2 presents a plot of rate constants as a function of the initial Cu^{2+} ion concentration. The values of the cementation rate constant (K) were determined from the slopes of the plots in Figure 1.

The cementation rate constant was found to decrease with increasing copper ion concentration until a value of about 36 g/l was reached, then the rate constant became independent of the initial copper ion concentration (Figure 2). MacKinnon and Ingraham⁴ observed similar results for cementation of copper on a rotating aluminum disc. The decrease in the cementation rate has been attributed to the following factors:

- changes of activity brought about by the increase in copper ion concentration,
- the rise in solution viscosity, and
- the decrease in the diffusivity of copper ions as a result of the increase of initial copper concentration in solution.

Effect of initial acid strength of solution

The effect of the initial acid concentration of the solution on

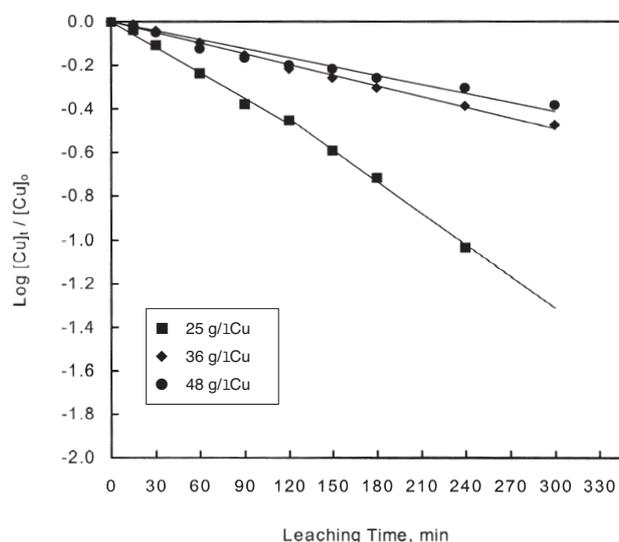


Figure 1—Variation of $\log[\text{Cu}^{2+}]_t/[\text{Cu}^{2+}]_0$ ratio with time at different initial Cu concentrations (205 rpm, 90 g/l initial acid, 60°C, 1.7 kg/l density)

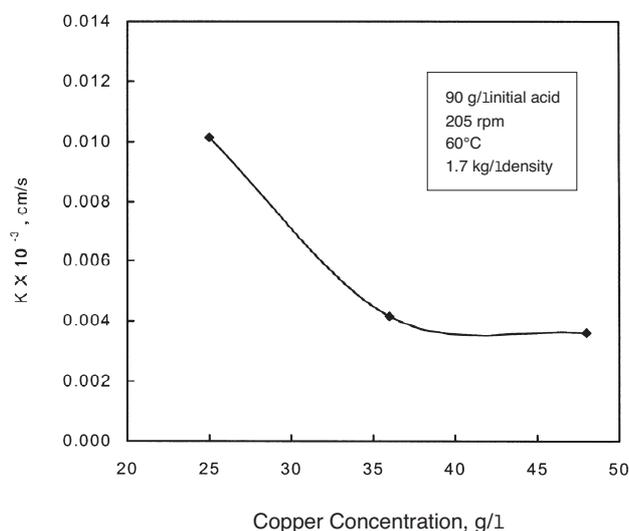


Figure 2—Variation of the rate constant (K) with initial Cu concentration

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the kinetics of cementation of copper on the Ni-Cu matte is shown in Figures 3 and 4. Figure 4 shows that the rate of copper cementation decreased with increasing acid concentration until a value of about 110 g/l H_2SO_4 was reached, then the rate became almost insensitive to the initial acid concentration. The decrease in the rate constant with increasing acidity may be attributed to redissolution of some of the precipitated copper due to increase in the acidity of the solution, especially in the presence of oxygen from the atmosphere. Beyond acid concentration of about 110 g/l the rate constants did not vary much with acid strength, probably because the rate of copper cementation was almost the same as the rate of copper redissolution.

Effect of pulp density

The effect of pulp density of the reaction mixture on the kinetics of copper cementation on the Ni-Cu matte particles is presented in Figures 5 and 6. Figure 6 illustrates the rate of copper cementation. It is evident that the cementation rate constant increased as the pulp density increased from 1.6 to 1.7 kg/l and reached a maximum value at about 1.7 kg/l, thereafter it decreased. The increase in the rate of copper cementation when the pulp density was increased from 1.6 to 1.7 kg/l may be attributed to the increase in the cathodic surface area of matte on which copper cementation takes place. The decrease in the rate constant for pulp density values greater than 1.7 kg/l was probably due to low mass-transfer rates of reactants and products caused by the increase in the quantity of matte in the reaction mixture. This may have caused the particles not to be suspended efficiently in the solution as the stirring rate was kept constant.

Effect of particle size distribution

The influence of particle size distribution of the matte on the kinetics of copper cementation is presented in Figures 7 and 8. The rate of copper cementation decreased with increasing

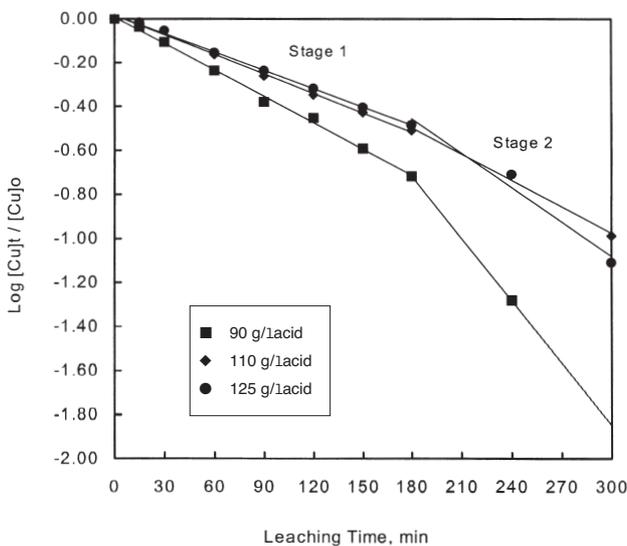


Figure 3—Variation of $\log[Cu^{2+}]_t / [Cu^{2+}]_0$ ratio with time at different initial acid strength (205 rpm, 25 g/l initial Cu concentration, 60°C, 1.7 kg/l density)

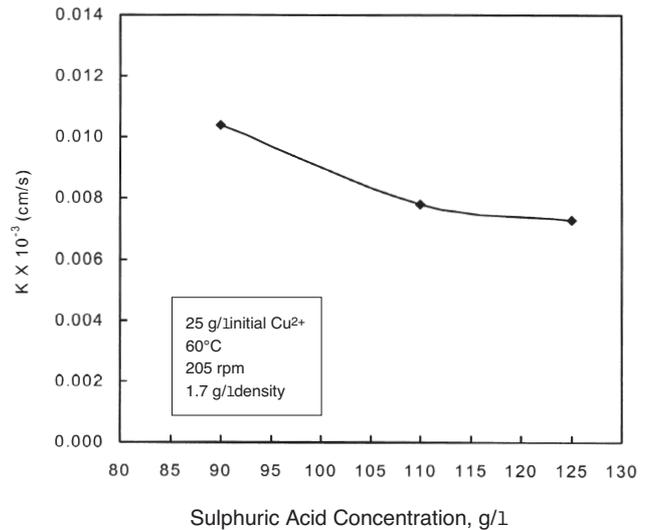


Figure 4—Variation of the rate constant (K) with initial acid strength

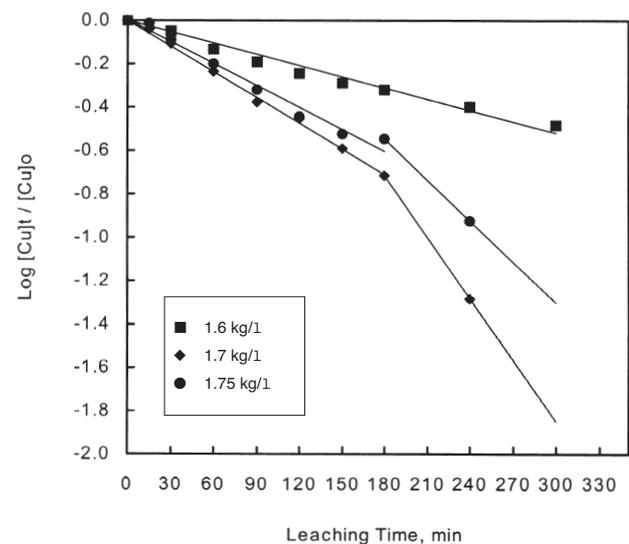


Figure 5—Variation of $\log[Cu^{2+}]_t / [Cu^{2+}]_0$ ratio with time at different pulp density values (205 rpm, 90 g/l initial acid, 60°C, 25 g/l initial Cu concentration)

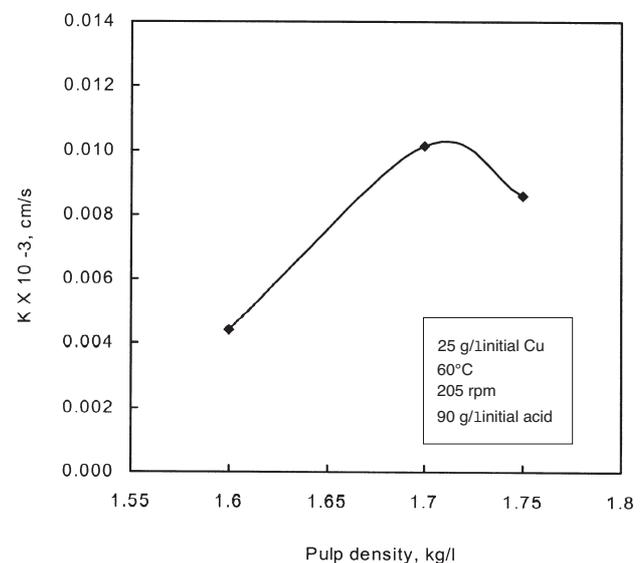


Figure 6—Variation of the rate constant (K) with pulp density of reaction mixture

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particle size (Figure 8). The faster rate of copper cementation observed with the finer size fraction may be attributed to the larger cathodic surface area presented by the finer particles. It can be seen that the rate of cementation is more sensitive to particle size in the last period of the cementation reaction for the finer size fractions (-45 μm and -106+45 μm), as shown in Figure 7. This is probably due to the changes in the matte particle morphology and lattice structure, which opened up and exposed more Ni particles to the solution. The morphology and structure of the cemented particles may also have an effect on the rate of cementation.

Effect of temperature

The effect of temperature on the cementation reaction kinetics of copper on the matte is shown in Figures 9 and 10. Figure 9 is a plot of $\log\left(\frac{[\text{Cu}^{2+}]_t}{[\text{Cu}^{2+}]_0}\right)$ against time at

various temperatures. From the slopes of these plots, cementation rate constants (K) were determined and plotted against $1/T$ (Arrhenius plot) as presented in Figure 10, which shows the effect of temperature on the rate constant for the first period (stage 1) of the reaction. It can be seen from these plots that the cementation rate constant increased with increase in temperature from 50 to 80°C. From the slopes of the plots in Figure 10, the activation energy of the reaction (E_a) was calculated using the Arrhenius relationship (Equation [6]). The results indicated that the reaction proceeded under two rate controlling mechanisms, as shown in Figure 10. MacKinnon *et al.*⁶ obtained similar results in their studies of cementation of copper on nickel discs. Annamalai and Hiskey³ also observed the two rate controlling mechanisms in their study of copper cementation on pure aluminium.

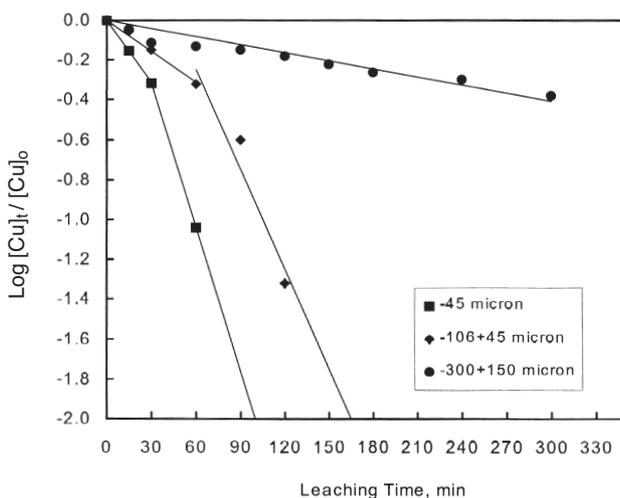


Figure 7—Variation of $\log\left(\frac{[\text{Cu}^{2+}]_t}{[\text{Cu}^{2+}]_0}\right)$ ratio with time at different matte particle sizes (205 rpm, 90 g/l initial acid, 25 g/l initial Cu concentration, 60°C, 1.7 kg/l density)

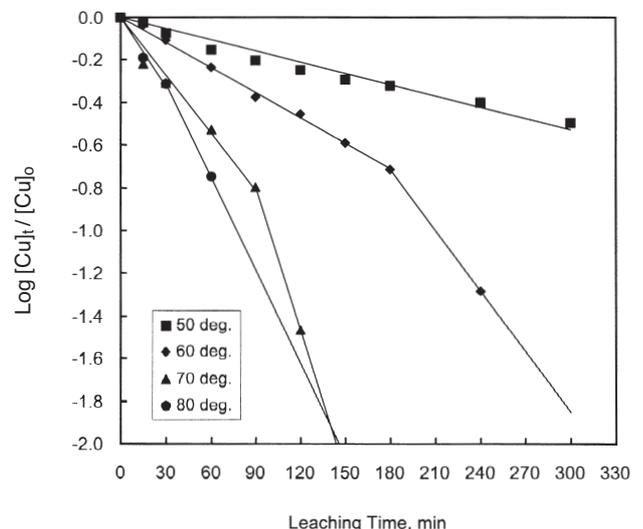


Figure 9—Variation of $\log\left(\frac{[\text{Cu}^{2+}]_t}{[\text{Cu}^{2+}]_0}\right)$ ratio with time at different temperatures, (205 rpm, 90 g/l initial acid, 25 g/l initial Cu concentration, 1.7 kg/l density)

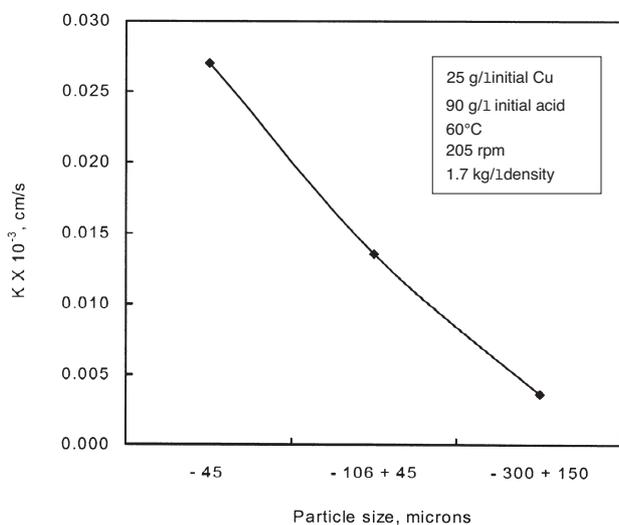


Figure 8—Variation of the rate constant (K) with matte particle size distribution

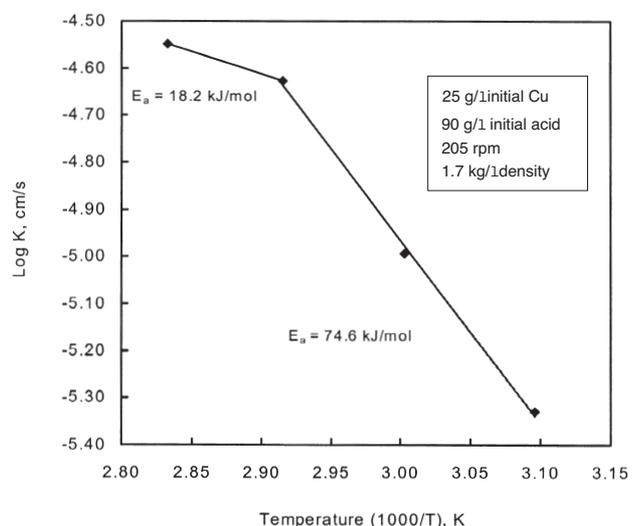


Figure 10—Variation of the rate constant (K) with temperature

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Two distinct activation energies, namely 18.2 kJ/mol at high temperatures (70–80°C) and 74.6 kJ/mol for lower temperatures (50–70°C) were obtained. These values of the activation energy indicated that the rate of the reaction was probably controlled by a boundary layer ionic diffusion mechanism at higher temperatures. At low temperatures, the activation energy was quite high, indicating that the rate was probably controlled by a surface reaction. This result agrees with the observed insensitivity of the cementation rate constants to variations in the stirring rates at a temperature of 60°C (Figure 12), which suggests a surface reaction controlled cementation process. MacKinnon *et al.*⁶ observed similar cementation behaviour and obtained an activation energy of 7 Kcal/mol (29 kJ/mol) for a temperature range of 59°C–84°C, and 44 kcal/mol (184.2 kJ/mol) for a temperature range of 49°C–59°C, for copper cementation on nickel discs. They attributed their results to the presence of an oxide film on the surface of the disc, which retarded the cementation reaction. High temperatures help breakdown the oxide layer and therefore the reaction proceeds at a faster rate. The high value of the activation energy and low rate of cementation observed at low temperatures in the present study may be attributed to the small surface area of nickel particles that was exposed to the aqueous copper ions, since most of the matte particles consisted of Ni-Cu sulphide minerals. The presence of an oxide film on the reaction surface may have been another reason for the observed results.

Effect of stirring rate

The effect of stirring rate on the kinetics of copper cementation onto the matte is presented in Figures 11 and 12. Figure 12 shows a slight increase in the cementation rate constant with increase in stirring rate up to a value of about 205 rpm, and then the rate becomes insensitive to agitation. This result, together with activation energy of 74.6 kJ/mol (see Figure 10), indicates that the rate of cementation is probably chemical reaction controlled under the employed leaching conditions (Figure 12). Nadkarni *et al.*¹ reported similar results from a kinetic study of copper precipitation on iron.

Nature of the cemented deposit

The nature of the deposit, with regard to size and shape of the particles, could not be determined due to the small quantity of the deposit in comparison with the leach solid residue. Examination of the initial matte and the leach residue under a scanning electron microscope did not clearly show the difference in particle size and shape between the initial matte sample and the final leach residue, as the deposit was mixed with the residue (Figure 13).

Conclusions

- ▶ The kinetics of cementation of copper onto Ni-Cu converter matte is influenced by process parameters such as copper concentration, free acid concentration, temperature, particle size distribution and pulp density. Variations in the stirring rates appear to have little or no effect on the cementation kinetics, under the applied experimental conditions.

- ▶ A two-stage rate of reaction was observed in most of the experiments (initial and enhanced second stage). However, it was not observed in some tests where the reaction rate was slow throughout the experiment. The enhanced rate of reaction observed in stage 2 is attributed to the nature of the cementation deposit.
- ▶ The cementation reaction followed a mixed control mechanism. At a temperature range of 50–70°C, the rate was found to be controlled by surface chemical reaction ($E_a = 74.6$ kJ/mol); and at higher temperatures (70–80°C) it was controlled by boundary layer mass transfer mechanism ($E_a = 18.2$ kJ/mol).
- ▶ The nature of the cemented product could not be determined in the present system where the leach solid residue was much more than the cementation product.

Acknowledgement

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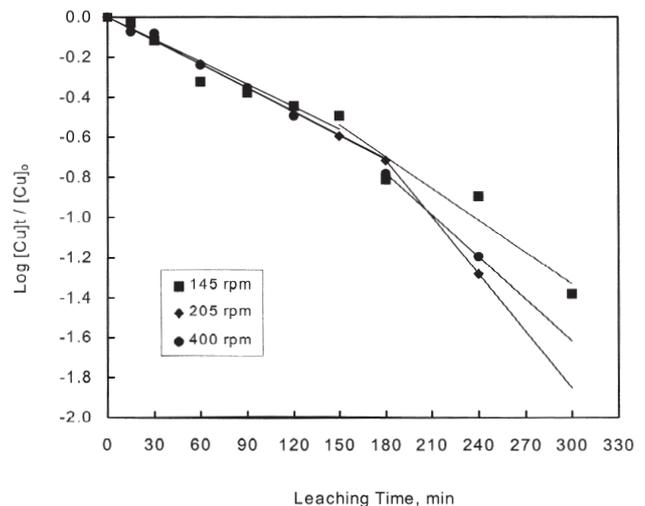


Figure 11—Variation of $\log[\text{Cu}^{2+}]_t / [\text{Cu}^{2+}]_0$ ratio with time at different stirring rates (90 g/l initial acid, 25 g/l initial Cu concentration, 60°C, 1.7 kg/l density)

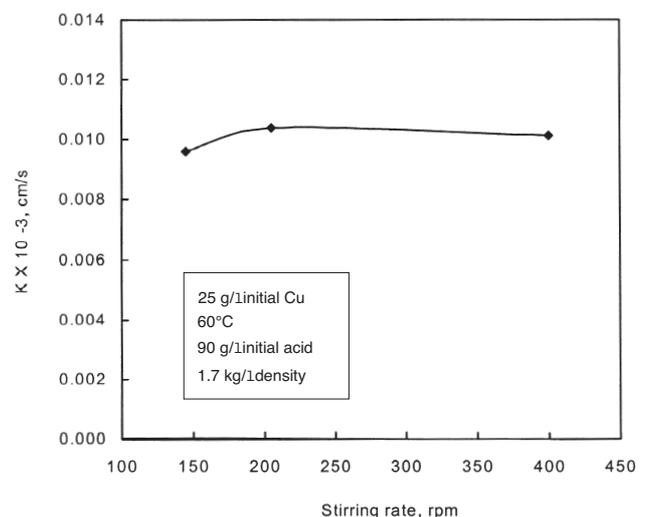


Figure 12—Variation of the rate constant (K) with stirring rate

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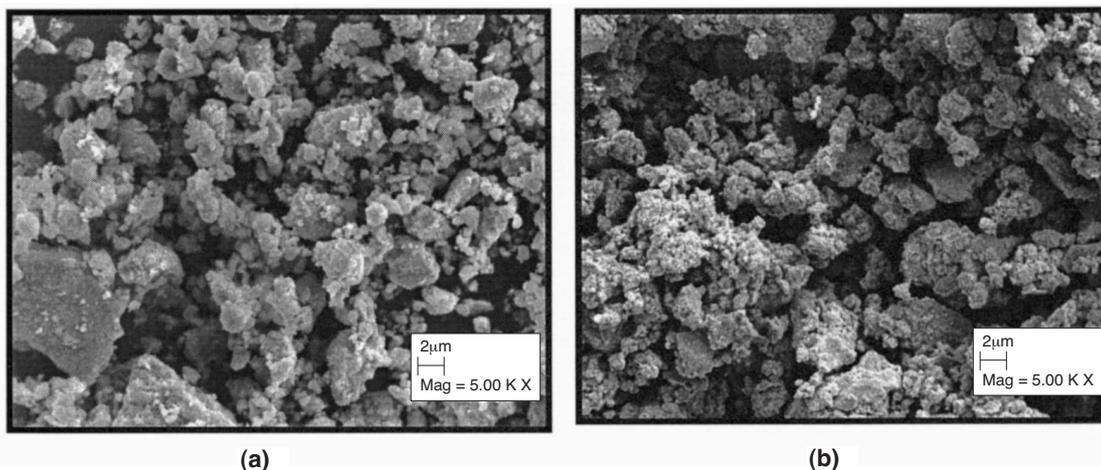


Figure 13—SEM images of matte particles: (a) before leaching, (b) after 5 hours of leaching

References

1. NADKARNI, R.M., JELDEN, C.E., BOWLES, K.C., FLANDERS, H.E., and WADSWORTH, M.E. A kinetic study of copper precipitation on iron – Part I. *Transactions of the Metallurgical Society of AIME*, 1967. Vol. 239, pp. 581–585.
2. ANNAMALAI, V. and MURR, L.E. Influence of deposit morphology on the kinetics of copper cementation on pure iron. *Hydrometallurgy*, vol. 4, 1979, pp. 57–82.
3. ANNAMALAI, V. and HISKEY, J.B. A kinetic study of copper cementation on pure aluminum. *Society of Mining Engineers*, June, 1978, pp. 650–659.
4. MCKINNON, D.J. and INGRAHAM, T.R. Kinetics of Cu(II) cementation on a pure aluminum disc in acidic sulphate solution. *Canadian Metallurgical Quarterly*, vol. 9, no. 3, 1970, pp. 443–448.
5. DONMEZ, B., SEVIM, F., and SARAC, H. A kinetic study of the cementation of copper from sulphate solutions onto a rotating aluminum disc. *Hydrometallurgy*, vol. 53, 1999, pp. 145–154.
6. MCKINNON, D.J., INGRAHAM, T.R., and KERBY, R. Copper cementation on nickel discs. *Canadian Metallurgical Quarterly*, vol. 10, no. 3, 1971, pp. 165–169. ◆

3CR12 Stanchions ideal for harsh conditions*

Tubular handrail systems which include stanchions and bends manufactured from 3CR12 are available from Andrew Mentis.

Bruce Sprake, marketing manager for Andrew Mentis, explains that 3CR12 is an extremely hardwearing material and ideal for use in arduous environments.

The 3CR12 stanchions are 42 mm in diameter with a 2 mm wall thickness and provide greater strength than normal handrail stanchions. The Andrew Mentis handrail system has clean, modern lines and the stanchions can be supplied in a variety of standards angles with accessories to match.

The stanchions, which are spun, flared and of tubular construction, are easy to install as part of an integral system and no special tools are required.

The stanchion base plates are designed to allow moisture to drain from the stanchion. The bends and

closures have swaged ends allowing easier erection and helping to stop moisture entering the joints.

Andrew Mentis has been manufacturing handrail systems, grating, expanded metals and highway guardrails for more than fifty years. The company's ISO 9002-accredited operation is based in Elandsfontein, Gauteng, with branches and distribution outlets in Durban, Cape Town and Pretoria. ◆

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Future looks hot for SA platinum manufacturing industry*

A revolutionary induction casting machine launched this December in Cape Town is making waves as the most exciting development to ever hit the South African platinum jewellery manufacturing industry. According to Ali Brey, managing director of Hot Platinum—a Cape based company heading the commercialization of the machine—the new technology has the potential to catapult the local jewellery manufacturing industry into the international marketplace.

'The worldwide platinum jewellery manufacturing industry is worth over US \$10 billion a year, with America, China and Japan the largest manufacturers of platinum jewellery,' said Brey.

'We in South Africa are sitting on around 70% of the world's platinum reserves but we produce less than 0.5% of its platinum jewellery—with this enabling technology we now have the capability to make use of our own resources and take a leading role in the global platinum jewellery marketplace.'

He adds that what makes the new technology such a breakthrough is the fact that it is the world's most compact and versatile casting solution to melt platinum, one of the most difficult metals to work with as it requires temperatures of nearly 2 000 degrees Celsius to melt. The machine can also melt gold, silver, titanium and stainless steel, and even plugs into a standard household 220 V plug.

'It's this unique set of features that makes it ideal for small and medium jewellery manufacturers, and this means that the local industry will be the first to benefit from this technology,' he said.

The machine, branded as the ICON 3CS, has been both designed and manufactured in South Africa. It is the product of collaboration between UCT's Electrical Engineering department and Cape Technikon. An award from the Innovation Fund funded the research. The research and development was headed up by Irshad Khan and Professor Jon Tapson, both lecturers at UCT.

The new technology has already attracted the attention of South Africa's top brass. The Hot

Platinum team was in the spotlight recently when they were commissioned to manufacture the platinum components for parliament's new mace. It's not often that a start-up venture finds its way into so public and symbolic an application.

'That was a special and rewarding moment for the whole team who have all put in an exceptional effort, and I think it's a wonderful sign to this country of the great things that can be achieved with the application of this technology,' said Brey.

Brey is well placed to tackle the commercialization of the technology. He earned his stripes travelling the world in the wireless communications sector, responsible for taking Nokia's cutting-edge technologies around the globe. In addition, he has an MBA under his belt from the UCT Graduate School of Business (GSB), which he completed in 2001.

'The ICON 3CS, no bigger than a microwave oven, is now set to put the power of mass production technology into the hands of jewellers in South Africa,' said Brey.

While before the only alternative was hugely expensive and big casting machines from overseas or the laborious and dangerous traditional method of a jeweller's torch, manufacturers now have access to an extremely effective machine that can melt anywhere between 20 and 300 g of platinum at one time.

'This big melting capacity and wide range means that small companies don't have to buy a new machine when their output increases. The technology will sustain them both as small players and as mass producers. In addition, if a company does just 30 casts with this machine, they would have already manufactured product that will earn them back what they paid for the machine,' said Brey. ♦

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