（＊掲載記事題目及び掲載頁は変更になる場合があります。）

Fundamentals of High Temperature Processes

Phase equilibria and slag formation in the magnetite core of fluxed iron ore pellets

A.R.FIRTH et al.

Distinctly different morphologies of pellet microstructure develop in the oxidised hematite shell and the reduced magnetite core during induration. Individual pellet induration experiments in an air atmosphere showed that slag formed at lower temperatures in the magnetite core, with molten slag forming between 1 100 and 1 150°C compared to 1 200°C in the oxidised outer rim. The amounts of slag formed were not large enough for accurate compositions to be determined, however. Experiments were then conducted with pellet sized magnetite compacts, held at a temperature between 1 075 and 1 225°C for 20 min in a nitrogen atmosphere containing 0.5% oxygen (p_{O_2}=0.005 atm). The aim was to retain magnetite as the stable iron oxide and to generate larger pools of molten slag. These tests showed that a eutectic iron calcium silicate melt can form within the silica particles at temperatures as low as 1 100°C. Surrounding these silica particles, a melt-like morphology appears, although the remaining slag has a wollastonite ($CaSiO_3$) composition. As wollastonite is not molten at the temperatures studied the iron oxide from the slag would have been absorbed by the surrounding magnetite. Above 1 175°C, the molten eutectic slag can be observed to fill in gaps between the magnetite particles after dissolving nearly all the calcium and silicon. This behaviour suggests that the oxygen partial pressure varies greatly within the magnetite core of iron ore pellets and has a strong influence on slag formation. Formation of slag in iron ore pellets is important as sufficient slag must be formed to bond the pellet, but not so much that the core becomes too heavily sintered, pulling away from the shell and reducing pellet strength.

(cf. *ISIJ Int.*, **48** (2008), 1485)

Mill scale for synthesis of Fe–Ni and Fe–Ni–Co alloys through gaseous reduction: Reaction kinetics and mechanism

M.BAHGAT et al.

Nickel and Nickel cobalt ferrite powders were prepared through the ceramic route by calcination of a stoichiometric mixture of nickel oxide, cobalt oxide and mill scale as source for iron oxide. The produced ferrites powders were isothermally reduced in pure hydrogen at 800–1 100°C. Based on thermogravimetric analysis, the reduction behavior of the synthesized ferrite and the kinetics reaction mechanism were studied. The initial ferrite powder and the various reduction products were characterized by XRD, SEM and reflected light microscope to reveal the effect of hydrogen reduction on composition, microstructure and reaction kinetics of synthesized ferro-alloys. The activation energy values were calculated from Arrhenius equation. The approved mathematical formulations for the gas solid reaction were applied to confirm the estimated rate controlling reaction mechanism. Complete reduction of home made ferrite powder was achieved with synthesize of nanocrystalline Fe–Ni and Fe–Ni–Co alloys.

(cf. *ISIJ Int.*, **48** (2008), 1493)

Estimation of bulk density distribution in particle charging process using discrete element method considering particle shape

M.AKASHI et al.

In order to analyze the segregation of coal particles in coke oven, it is necessity to consider the coal shape in Discrete Element Method (DEM). In this paper, the effect of particle shape on the granular flow and on bulk density distribution was investigated, and the novel method for considering particle shape on the void fraction in packed bed was proposed by changing contact distance between particles. The flowing behavior of tablet shaped polystyrene (PS) particles was analyzed and compared with simulation result which was calculated by spherical element or multi-sphere element. The results of flowing velocity and its angle using spherical element and multi-sphere one gave the similar tendency and they were correlated with experimental ones. Thus, the flowing behavior of non-spherical particle can be simulated by spherical element, as long as the suitable parameters were used. The bulk density distribution in horizontal direction in the simulated results using spherical element gave the different tendency of experimental one. On the other hand, those in multi-sphere element and new method showed the similar tendency to the experimental one. Thus, the bulk distribution cannot be simulated by using spherical element. The calculation speed of new method is 4.5 times faster than that of multi-sphere method. This method could be applied to coal packing simulation, and the bulk density distribution by using it had a good correlation with experimental one. Therefore, this method for considering the particle shape on the charged bed is very useful.

(cf. *ISIJ Int.*, **48** (2008), 1500)

Characteristics of fine oxide particles produced by Ti/*M* (*M*=Mg and Zr) complex deoxidation in Fe–10mass%Ni alloy

A.V.KARASEV et al.

Characteristics of oxide particles produced by Ti/*M* (*M*=Mg and Zr) complex deoxidation have been studied in an Fe–10mass%Ni alloy as a function of holding time at 1 600°C, followed by quenching. The size distributions for the particles having different compositions are compared with the particle size distribution in single deoxidation with Ti, Mg or Zr. In most experiments the composition of particles precipitated during rapid quenching was found to be non-equilibrium phase. The formation mechanism of primary and secondary deoxidation particles and the difference in the compositions of non-clustered and clustered particles are discussed. The effects of Ti addition, method of deoxidation and holding time at 1 600°C on particle size distributions in Ti/*M* complex deoxidation experiments are studied.

(cf. *ISIJ Int.*, **48** (2008), 1507)

Application of modified coke to NO_x reduction with recycling flue gas during Iron ore sintering process

Y.CHEN et al.

A new process, named NO_x reduction by the modified coke with recycling flue gas, was proposed. The coke samples loaded with K_2CO_3, CaO and CeO_2 were characterized by SEM. The effects of the recycled flue gas and the modified coke on NO_x reduction were investigated with a quartz fixed bed reactor and a sintering pot. The results showed that the extent of the contact between additives and coke was: K_2CO_3>CaO>CeO_2. In the modified coke combustion with recycling flue gas, the concentration of NO_x emission was decreased, furthermore, the NO_x reduction ratio increased with the loading amount of additives. The NO_x reduction ratios were 48.1%, 20.2% and 20.6% respectively when the loading amount of K_2CO_3, CaO and CeO_2 was 2.0%. In sintering pot tests, the coke loaded with 2.0% CeO_2 was used as fuel and the recycled flue gas, simulated by the gas mixture with 50 ppm NO, was introduced to sintering process, the NO_x reduction ratio was 38.0%, which was about 13% higher than that of the base run with recycling flue gas.

(cf. *ISIJ Int.*, **48** (2008), 1517)

Materials design for the fabrication of porous glass using phase separation in multi-component borosilicate glass

M.SUZUKI et al.

Porous glass was fabricated using spinodal decomposition in multi-component oxide glass and leaching out one of the decomposed phases with acid solution. Multi-component borosilicate glass compositions were designed for the porous glass by partially replacing SiO_2 by B_2O_3 in silicate glass compositions where the occurrence of spinodal decomposition was confirmed. One of separated phases formed by the spinodal decomposition in the borosilicate glass was leached out with acid solution and then porous glass was obtained. The microstructure in porous glass was observed by field emission scanning electron microscopy, and the development of an interconnected porous structure was indicated. Prediction of the phase separation was attempted for multi-component borosilicate glass compositions investigated in this study by calculating the Gibbs energy of super-cooled liquid phase. It was revealed the calculated metastable liquid–liquid immiscibility boundaries in these borosilicate systems do not coincide with experimental results for the occurrence of phase separation. For the precise estimation of the miscibility gap in the multi-component oxide glasses containing B_2O_3, the temperature and composition dependence of Gibbs energy of liquid phase, including the super-cooled liquid state, should be optimized.

(cf. *ISIJ Int.*, **48** (2008), 1524)

Aluminum deoxidation equilibrium of molten Fe–Ni alloy coexisting with alumina or hercynite

A.HAYASHI et al.

Aluminum deoxidation equilibrium of molten

Fe–Ni alloy was determined by chemical equilibrium method at temperature of 1 873 to 1 973 K. Also, critical point in molten Fe–40mass%Ni alloy that coexisted with Al_2O_3 and $FeO \cdot Al_2O_3$ was determined experimentally at 1 973 K. Solvent extraction method was applied to improve the analytical accuracy of the low aluminum content in molten Fe–Ni alloy. The relation between aluminum and oxygen contents in molten Fe–Ni alloy equilibrated with Al_2O_3 or $FeO \cdot Al_2O_3$ was estimated in the whole alloy composition range at 1 873 to 1 973 K by utilizing the metallic solution model based on Darken's quadratic formalism and Redlich–Kister type polynomial.

(cf. *ISIJ Int.*, **48** (2008), 1533)

Steelmaking

Chemical reaction of glazed refractory with Al-deoxidized molten steel

J.-H.SON et al.

A high alumina refractory, glazed by typical ladle slag of $CaO–MgO–Al_2O_3–SiO_2$ was investigated to understand the influence of the glazed refractory on the generation of non-metallic inclusions in Al-deoxidized molten steel at 1 600°C. The variations of microstructure and chemistry of the glazed refractory with reaction time were studied. Thermodynamic analysis was simultaneously carried out to understand the complex chemical reactions. During the reaction between the glazed refractory and molten steel, two chemical reactions were observed: between glaze and molten steel, and between glaze and original refractory. By the chemical reactions, SiO_2 in the glaze was reduced to [Si] by [Al] in molten steel. The glaze layer also gradually changed from the liquid $CaO–MgO–Al_2O_3–SiO_2$ phase with small amount of embedded spinel particles to the liquid $CaO–MgO–Al_2O_3$ phase with embedded spinel and $CaAl_4O_7$ particles. Severe erosion was observed in the porous spinel area of a refractory. Spinel inclusions were found as major inclusions originated from the glazed refractory. The erosion mechanism of the glazed refractory was proposed in the present study.

(cf. *ISIJ Int.*, **48** (2008), 1542)

Thermodynamic evaluation of formation of oxide–sulfide duplex inclusions in steel

S.K.CHOUDHARY et al.

Calcium is widely used for improving the castability of liquid steel, as well as for improvement of steel cleanliness and inclusion modification for better quality steel. Calcium modifies solid alumina inclusions, arising out of deoxidation of liquid steel, into liquid calcium aluminate. Depending upon the steel composition, calcium sulfide (CaS) and/or various forms of calcium aluminates may form. Sulfides are often associated with the oxide phase, which is typically known as oxide–sulfide duplex inclusion. Formation of solid calcium sulfide must be avoided during the ladle treatment of liquid steel, since it is detrimental to the castability of steel. In the present work a thermodynamic model has been developed for predicting the formation of oxide–sulfide duplex inclusions arising out of competitive reactions between [O], [S] and [Ca] in Al-killed steel. The model predictions of the present work were compared with those reported in literature, as well as with the types of inclusions observed in steel samples collected from the plant. Reasonably good agreements amongst them were observed. The results indicated that in order to achieve completely liquid calcium aluminate without forming any sulfides the sulfur content of liquid steel must be sufficiently low. With increasing S content of liquid steel, complete modification of alumina inclusions into liquid calcium aluminate becomes difficult. The maximum sulfur content to avoid formation of CaS depends upon the steel composition, principally aluminum. The sulfide inclusions are often a solid solution of CaS and MnS. Thermodynamic analysis for this system was also carried out. Based on the analysis in the present work, it is possible to predict the influence of sulfide composition on formation of duplex inclusions.

(cf. *ISIJ Int.*, **48** (2008), 1552)

Welding and Joining

Improvement of weld characteristics by variation in welding processes and parameters in joining of thick wall 304LN stainless steel pipe

S.KULKARNI et al.

Various properties of weld joints of 25 mm thick wall 325 mm O.D, 304LN austenitic stainless steel pipe prepared by using different welding process and conventional V-groove as per AWS specification have been compared. The welding was carried out by commonly used shielded metal arc welding (SMAW), gas metal arc welding (GMAW) and pulsed current gas metal arc welding (P-GMAW) processes. In P-GMAW process the influence of pulse parameters have been studied by considering their summarized influence defined by a dimensionless hypothetical factor $\phi=[(I_b/I_p)f \cdot t_b]$ where, $t_b=[(1/f)-t_p]$. The characteristics of weld joints with respect to their metallurgical, mechanical, corrosion and fracture mechanics properties as well as residual stresses have been studied and compared. Welding of thick wall stainless steel pipe by P-GMAW process significantly improves the tensile properties, reduces the inclusion and porosity content, increases initiation fracture toughness and lowers residual stresses of weld joint in comparison to those observed of SMA and GMA weld joints. The influence of ϕ on properties of P-GMA weld joints is primarily attributed to the reduction in severity of weld thermal cycle and refinement of microstructure of weld deposit.

(cf. *ISIJ Int.*, **48** (2008), 1560)

Influence of shielding gas on fume size morphology and particle composition for gas metal arc welding

K.R.CARPENTER et al.

Shielding gas is an important parameter in Gas Metal Arc Welding (GMAW). Nevertheless, the influence of shielding gas on particle composition and size distribution of welding aerosols is not clearly understood. Increasing the O_2 or CO_2 content of Ar-based shielding gases resulted in an increase in the average particle size. For binary and ternary Ar, CO_2, O_2 mixtures, increasing CO_2 had a greater impact than raising O_2 on particle size. Variations in Ar–He–CO_2 mixtures had the least influence. For 100% CO_2, the particle size distribution was altered significantly due to the change of the weld transfer mode to globular and particle size coarsened with increasing arc voltage. Shielding gas composition had no observable influence on particle composition and only a slight variation of composition with particle size was observed. Particles were identified as $(Fe,Mn)_3O_4$ with trace additions of Si.

(cf. *ISIJ Int.*, **48** (2008), 1570)

Surface Treatment and Corrosion

Improvement of the fatigue strength of stainless steel SUS316L by a cavitating jet with an associated water jet in water

H.SOYAMA et al.

Cavitation impact induced by a cavitating jet can be utilized to improve fatigue strength in the same way as shot peening. The peening method using cavitation impact is known as "cavitation shotless peening", as shot are not required. For practical purposes, enhancement of the cavitation impact is required in order to get a better peening effect and to shorten the processing time. In the present paper, intensification of the cavitation impact was successfully realized by injecting a low-speed water jet around a cavitating jet in water, and an improvement in the fatigue strength of stainless steel was demonstrated by subjecting treated materials to a fatigue test. The fatigue strength of stainless steel was improved by about 28% by cavitation shotless peening compared with a non-peened specimen. In order to clarify the mechanism for surface enhancement by cavitation shotless peening, the residual stress on the surface was measured using an X-ray diffraction method. It was shown that cavitation shotless peening using a cavitating jet with an associated low-speed water jet in water introduced compressive residual stress on the surface of the steel. Interestingly, it was also found that the full width at half maximum of the X-ray diffraction profile from the surface decreased, even though compressive residual stress of about 500 MPa had been introduced by the cavitation shotless peening.

(cf. *ISIJ Int.*, **48** (2008), 1577)

Transformations and Microstructures

A molecular dynamics study of the energy and structure of the symmetric tilt boundary of iron

Y.SHIBUTA et al.

The temperature dependences of the energy and structure of the symmetric tilt boundary of bcc and fcc iron were investigated by molecular dynamics simulation. A large energy cusp was observed at the bcc(112)⟨110⟩Σ3 and fcc(111)⟨110⟩Σ3 grain boundary plane, which is a twin boundary, whereas it was not observed at the bcc(111)⟨110⟩Σ3 plane in spite

of it having the lowest Σ-value. The grain boundary energy increased at the temperature close to the melting point except for the grain boundary planes that have a large energy cusp. On the other hand, it was newly founded that the grain boundary energies at the bcc(112)⟨110⟩Σ3 and fcc(111)⟨110⟩Σ3 did not increased despite such a high temperature. The increase in grain boundary energy was due to the premelting, which is a localized disorder of the atoms near the grain boundary energy. It was confirmed that the grain boundary energy is affected by the matching at the interface rather than the periodicity described by the Σ-value.

(cf. *ISIJ Int.*, **48** (2008), 1582)

Effects of dynamic strain aging on high temperature mechanical proprieties for a structural steel containing Mo and Nb

W.R.CALADO et al.

The influence of dynamic strain aging (DSA) on the high temperature strength of a structural steel microalloyed with Mo and Nb was investigated by means of tensile tests performed at temperatures ranging from 25 to 600°C and strain rates of 10^{-4} to 10^{-1} s-1. This steel showed a ferrite and pearlite microstructure. DSA manifestations are less intense than those observed for low carbon steels and they take place at higher temperatures. The secondary precipitation behavior of the steel was also investigated. The hardness of samples heat treated at 100 to 600°C displayed a maximum at 400°C. Samples treated at this temperature and tensile tested at 600°C didn't showed a higher yield strength than the untreated specimens, indicating that secondary precipitation does not contribute to its high temperature strength. Results obtained here indicated that DSA in the structural steel might be an important mechanism responsible for its fire resistance. The empirical activation energies related to the appearance of serrations on the stress–strain curves and to the maxima on the variation of tensile strength with temperature or disappearance of serrations suggested that the high temperature strengthening associated with DSA in this steel is the dynamic interaction of interstitial-substitutional solute dipoles and dislocations.

(cf. *ISIJ Int.*, **48** (2008), 1592)

Microstructural evolution during industrial rolling of a duplex stainless steel

G.FARGAS et al.

The microstructural evolution of a duplex stainless steel EN 1.4462 during the industrial rolling process has been examined. The ferritic and austenitic phases were analyzed separately after each rolling and annealing step. Optical microscopy and transmission electron microscopy, together with texture measurements, have been used to characterize the morphology and the preferred crystallographic orientations of both phases. Additionally, the hardness evolution in ferrite and austenite after each industrial step was measured by instrumented indentation. The results show that microstructural features observed after hot rolling tend to remain during further processing and they are essentially present in the final cold rolled and annealed product.

(cf. *ISIJ Int.*, **48** (2008), 1601)

Intragranular nucleation of ferrite on precipitates and grain refinement in a hot deformed V-microalloyed steel

S.F.MEDINA et al.

The intragranular nucleation of ferrite has been studied in a V microalloyed steel (C=0.103; Mn=1.463; V=0.139; N=0.0100% mass). Using torsion tests and applying the double deformation method known as "back extrapolation", the recrystrallised fraction of austenite has been determined for several deformation temperatures and two strain values (0.20 and 0.35) and has been plotted as a function of time. Recrystallisation-precipitation-time-temperature (RPTT) diagrams have then been drawn. The RPTT diagrams depict precipitation kinetics as a function of the temperature and time and this information has been used to study the intragranular nucleation of ferrite, cooling specimens from programmed temperatures and moments for which the precipitated volume and the average precipitate size (determined by TEM) are known. The results have allowed us to determine the contribution of intragranular nucleation to ferritic grain refinement, which was approximately 20%.

(cf. *ISIJ Int.*, **48** (2008), 1603)

Effects of volume fraction and carbon concentration of austenite on formation of ultrafine grained ferrite/austenite duplex microstructure by warm compression

P.XU et al.

The microstructures of two high-nickel martensite steels with different carbon contents before and after warm compression were comparably investigated by using a field-emission scanning electron microscope attached with an electron backscattering diffraction equipment (FE-SEM/EBSD) and a transmission electron microscope attached with an energy dispersive X-ray spectroscope (TEM/EDX). The microstructure observations suggest that the carbon addition is beneficial to reduce the critical strain for full recrystallization during warm compression and the increment of carbon-enriched austenite amount accelerates the dynamic recrystallization of ferrite through plastic deformation partitioning in the 17Ni–0.2C martensite steel. Proper pre-tempering promotes the precipitation of the carbon- and nickel-enriched austenite, and then promotes the dynamic recrystallization. On the other hand, long-time tempering leads to the carbon depletion in austenite so as to delay the dynamic recrystallization. The full recrystallization of the 18Ni martensite steel takes place at a higher strain during warm compression, mainly because of no carbon-enriched austenite.

(cf. *ISIJ Int.*, **48** (2008), 1609)

Dynamic recrystallization and dynamic precipitation behaviors of a 17Ni–0.2C martensite steel studied by *in situ* neutron diffraction

P.XU et al.

The austenite precipitation and dynamic recrystallization behaviors of 17Ni–0.2C martensite steel during isothermal tempering at 500°C followed by isothermal warm compression at 8.3×10^{-4}/s were investigated *in situ* using neutron diffraction. The Rietveld analysis of Time-Of-Flight neutron diffraction profiles revealed that the austenite amount increased by about 1.5% during 10 min isothermal holding while warm compression at 500°C markedly accelerated the austenite precipitation. Splitting of the austenite (111) peak occurred and then disappeared during warm compression. Based on integrated intensities obtained by single peak fitting of neutron spectra, it was found from the axial neutron spectra that the ferrite (110) peak intensity rapidly decreased and the ferrite (200) and (211) peak intensities slowly increased during warm compression; the occurrence of dynamic recrystallization led to an evident deviation from this trend. Comparison between lattice strains and texture indexes of austenite and ferrite suggested that the austenite was harder than the ferrite at 500°C. Thus, heterogeneous deformation occurred in the ferrite, leading to accelerated dynamic recrystallization.

(cf. *ISIJ Int.*, **48** (2008), 1618)

Microstructure, texture, grain boundary characteristics and mechanical properties of a cold rolled and annealed martensitic steel

C.GHOSH et al.

The microstructural and textural evolution and changes in Grain Boundary Character Distribution (GBCD) during annealing of a prior cold worked (30%, 50% and 80%) Fe–C martensitic steel have been studied, and correlated with mechanical properties. It has been demonstrated that ultrafine grains in the range 50–250 nm can be obtained by choosing appropriate amounts of cold rolling and annealing. Increasing the annealing temperature in all the three materials produces the expected results, namely decrement of strength with a concomitant increase in ductility. Although reasonably sharp γ-fibres were obtained in most of the cases, the very low r-bar values (<1.0) make the steels unsuitable for deep drawing purposes. It has been suggested that grain boundary engineering may lead to better strength–ductility combinations in this steel for enhanced range of applications.

(cf. *ISIJ Int.*, **48** (2008), 1626)

Model for predicting the microstructural evolution of extralow carbon steels

T.SENUMA et al.

The microstructural evolution of extralow carbon steels in hot working processes has been studied. Considering the experimental results of the microstructural evolution of austenite and the transformation behavior, a metallurgical model for predicting the microstructural evolution of extralow carbon steels in hot working processes was developed. The model was applied to hot rolling processes to evaluate the quantitative effect of various operation conditions on the grain refinement of ferrite and the calculated results were found to correlate relatively well to experimental ones.

(cf. *ISIJ Int.*, **48** (2008), 1635)

Mechanical Properties

Fatigue crack growth behavior of AISI 409M grade ferritic stainless steel welded joints using austenitic, ferritic and duplex stainless steel electrodes

A.K.Lakshminarayanan et al.

This paper reveals the fatigue crack growth behaviour of the shielded metal arc welded AISI 409M grade ferritic stainless steel joints fabricated using austenitic stainless steel (ASS), ferritic stainless steel (FSS) and duplex stainless steel (DSS) electrodes. Centre cracked tensile (CCT) specimens were prepared to evaluate fatigue crack growth behaviour. Servo hydraulic controlled fatigue testing machine with a capacity of 100 kN was used to evaluate the fatigue crack growth behaviour of the welded joints. It is found that the joints fabricated by DSS electrode showed superior fatigue crack growth resistance compared to the joints fabricated by ASS and FSS electrodes. Higher yield strength and relatively higher toughness of the weld metal may be the reasons for superior fatigue performance of the joints fabricated by DSS electrode.

(cf. *ISIJ Int.*, **48** (2008), 1640)

Formation and thermal fatigue properties of fine-grained heat affected zone on cast-hot-working-die steel after electropulsing stimulation with high current density

H.Lina et al.

The fatigue crack propagation behaviors of cast-hot-working die (CHWD) steel untreated and treated by electropulsing stimulation with different current densities were investigated in the present study. The elliptical heat affected zone (HAZ) was formed ahead of specimen notch tip due to the concentrating heat release induced by current bypassing and concentrating effect. The acreages of specimen HAZs were gradually enlarged because of the more heat energy input by elevating current density of electropulsing stimulation. The grain refinement and dislocation density increase in the specimen HAZs were enhanced by elevating the current density of electropulsing stimulation, which inevitably resulted in the improvement on the HAZ mechanical properties and the enhance of fatigue resistance. In addition, the induced compressive stress by electropulsing stimulation could decrease the peak value of tensile stress forming in the thermal fatigue process, which also enhanced the thermal fatigue resistance. Consequently, the resistance to thermal fatigue of CHWD steel was enhanced by grain refinement, dislocation density increase and induced compressive stress after electropulsing stimulation with high current density.

(cf. *ISIJ Int.*, **48** (2008), 1647)

New Materials and Processes

Chromium(VI) resistance and extracellular polysaccharide (EPS) synthesis by *Pseudomonas*, *Stenotrophomonas* and *Methylobacterium* strains

S.Ozturk et al.

Microorganisms have great value in research, for multiple purposes during the last several decades. Resistance of various strains of microorganisms against chromium and the production of the extracellular polysaccharide (EPS) had been experimented and reveals the fact that the most of the strains (*Pseudomonas*, *Stenotrophomonas*, *Methylobacterium*) which produced high concentration of EPS shown resistance to Cr(VI). The most resistant *Methylobacterium mesophilium* MU141 (435 mg/L) secreted higher EPS than the rest of the strain. The toxic effect of Cr(VI) on cell viability and total cell protein of *M. mesophilium* MU 141 was treated by different concentration of Cr(VI), ranged from 15 and 35 ppm for 24 h. Hence, concentration of Cr(VI) can affect the EPS production at certain spectrum. Therefore, the result discloses the correlation between Cr(VI) resistance and EPS production among *Pseudomonas*, *Stenotrophomonas*, *Methylobacterium* strains.

(cf. *ISIJ Int.*, **48** (2008), 1654)