Achievement Standard

Subject Reference	Chemistry 2.1				
Title	Carry out qualitative analysis				
Level	2	**Credits**	3	**Assessment**	Internal
Subfield	Science				
Domain	Chemistry				
Status	Expiring			**Status date**	17 November 2011

This achievement standard is expiring. Assessment against the standard must take place before the expiry date set out below.

Expiry date	31 December 2012	**Date version published**	17 November 2011

This achievement standard involves carrying out procedures and using knowledge of precipitation reactions to determine ions present in solution.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Carry out given procedures to determine ions present in solution.	• Carry out given procedures to determine ions present in solution, and justify the identification.	• Carry out given procedures, involving the formation of complex ion(s), to determine ions present in solution, and justify the identification.

Explanatory Notes

1 This achievement standard is derived from *Chemistry in the New Zealand Curriculum*, Learning Media, Ministry of Education, 1994, achievement objectives 7.1, 7.2, and 7.3, p. 23, and the section on 'Developing Scientific Skills and Attitudes in Chemistry', pp. 34-35.

2 Procedures outlined in *Safety and Science: a Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000, should be followed.

3 A table of ions will not be provided.

4 A procedure, such as a flow chart, to assist in determining the unknown ions will be provided.

5 Ions to be identified will be limited to: Ag^+, Al^{3+}, Ba^{2+}, Cu^{2+}, Fe^{2+}, Fe^{3+}, Mg^{2+}, Pb^{2+}, Na^+, NH_4^+, Zn^{2+}, Cl^-, CO_3^{2-}, I^-, NO_3^-, OH^-, SO_4^{2-}. Na^+ and NO_3^- are identified by a process of elimination. NH_4^+ will be identified using its reaction with NaOH.

6 For achievement, determination of the ions must be supported by experimental observations and identification of precipitates formed. This could include distinguishing between named pairs of anions or pairs of cations.

7 For merit, determination of the ions must be supported by experimental observations and identification of precipitates formed. Justification must include balanced equations for the reactions where precipitates are formed.

8 For excellence, justification must include balanced equations for the formation of complex ions. Complex ions may include $FeSCN^{2+}$ and those formed when $OH^-(aq)$ or $NH_3(aq)$ react with cations listed in 5 above, such as $[Ag(NH_3)_2]^+$, $[Al(OH)_4]^-$, $[Pb(OH)_4]^{2-}$, $[Zn(OH)_4]^{2-}$, $[Zn(NH_3)_4]^{2+}$, $[Cu(NH_3)_4]^{2+}$.

Replacement Information
This achievement standard has been replaced by AS91162.

Quality Assurance

1 Providers and Industry Training Organisations must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.

2 Organisations with consent to assess and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Consent and Moderation Requirements (CMR) reference 0226