

## Achievement Standard

**Subject Reference** Chemistry 2.2

**Title** Carry out procedures to identify ions present in solution

**Level** 2      **Credits** 3      **Assessment** Internal

**Subfield** Science

**Domain** Chemistry

**Status** Registered      **Status date** 17 November 2011

**Planned review date** 31 December 2018      **Date version published** 20 November 2014

This achievement standard involves carrying out procedures to identify ions present in solution.

### Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> <li>Carry out procedures to identify ions present in solution.</li> </ul>	<ul style="list-style-type: none"> <li>Carry out procedures to justify the identification of ions present in solution.</li> </ul>	<ul style="list-style-type: none"> <li>Carry out procedures to comprehensively justify the identification of ions present in solution.</li> </ul>

### Explanatory Notes

- This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 7. The standard is aligned to the Nature of Science achievement objectives and the Material World achievement objectives, and is related to the material in the *Teaching and Learning Guide for Chemistry*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>.

This standard is also derived from Te Marautanga o Aotearoa. For details of Te Marautanga o Aotearoa achievement objectives to which this standard relates, see the [Papa Whakaako](#) for the relevant learning area.

- Procedures outlined in *Safety and Science: a Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 2000, should be followed.
- Carry out procedures to identify ions* involves collecting primary data and using these observations to identify ions in solution using a procedure provided.

*Carry out procedures to justify the identification of ions* involves writing balanced equations for all the reactions where precipitates are formed.

*Carry out procedures to comprehensively justify the identification of ions* involves interpreting observations by recognising the formation of complex ions and writing balanced equations for these reactions.

- 4 Identification of ions must be supported by experimental observations and identification of all precipitates formed.
- 5 Ions to be identified will be limited to:  $\text{Ag}^+$ ,  $\text{Al}^{3+}$ ,  $\text{Ba}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Fe}^{2+}$ ,  $\text{Fe}^{3+}$ ,  $\text{Mg}^{2+}$ ,  $\text{Pb}^{2+}$ ,  $\text{Na}^+$ ,  $\text{Zn}^{2+}$ ,  $\text{Cl}^-$ ,  $\text{CO}_3^{2-}$ ,  $\text{I}^-$ ,  $\text{NO}_3^-$ ,  $\text{OH}^-$ ,  $\text{SO}_4^{2-}$ .  $\text{Na}^+$  and  $\text{NO}_3^-$  are identified by a process of elimination.
- 6 Complex ions are limited to  $[\text{FeSCN}]^{2+}$  and those formed when  $\text{OH}^-(\text{aq})$  or  $\text{NH}_3(\text{aq})$  react with cations listed in EN 5 above, ie  $[\text{Ag}(\text{NH}_3)_2]^+$ ,  $[\text{Al}(\text{OH})_4]^-$ ,  $[\text{Pb}(\text{OH})_4]^{2-}$ ,  $[\text{Zn}(\text{OH})_4]^{2-}$ ,  $[\text{Zn}(\text{NH}_3)_4]^{2+}$ ,  $[\text{Cu}(\text{NH}_3)_4]^{2+}$ .
- 7 Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards>.

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### Replacement Information

This achievement standard replaced AS90305.

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### 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

0233