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| Year 12 Chemistry: Lab 1 Validation Test  **Le Chatlier's Principle** | | |
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| **Name:** | **Teacher:** | **Mark / 25** |
| **Comment:** | | |

One equation for the equilibrium involving chromate and dichromate ion is

2 CrO42- + 2H+ ←→ Cr2O72- + H2O

Yellow Orange

A solution is prepared which contains 0.05 molar of both potassium chromate and potassium dichromate.

Two samples of this mixture are taken and to each of them the following are added.

Sample 1: Excess 0.2 molar hydrochloric acid

1. What colour is the final solution? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(1 mark)

Sample 2: Excess 0.2 molar sodium hydroxide

2. What colour is the final solution? \_\_\_

(1 mark)

3. Explain the observations for **both** samples of the solution using Le Chatlier's Principle.

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| Adding HCl: |
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| Adding NaOH: |
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(8 marks)

The equilibrium of cobalt(II) chloride – 6 water and CoCl42- ion is:

Co(H2O)62+(aq) + 4 Cl- (aq) ↔ CoCl42-(aq) + 6H2O (l) Δ = +ve

If CoCl2.6H2O is added to water.

4. What colour would the solution be? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 mark)

If sufficient HCl is added to the solution to bring about a colour change.

5. What colour will the solution become? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 mark)

6. In terms of Le Chatliers principle, explain the colour change that occurred with

the addition of HCl. (4 marks)

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The **final** solution from Q. 5 is heated gently **and** then cooled in an ice bath.

7. Describe the colour changes that would occur from the final solution.

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(3 marks)

8. Use Le Chatlier’s Principle to explain the colour changes that occurred in Q 7.

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| Gently Heating: |
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| Ice bath: |
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(6 marks)

**End of Lab Validation**

**Total Mark / 25**