**LESSON PLAN**

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| Term | Date | Subject | Class | Unit No | Lesson No | Duration | Class size |
| I | 13 /01/ 2020 | CHEMISTRY | S6 | 1 | 1 of 7 | 80 min | 24 |
| Type of Special Educational Needs to be catered for in this lesson | No one |
| Unit title | Properties and uses of transition metals  |
| Key Unit Competence: | The learner should be able to explain the properties and uses of transition metals.  |
| Title of the lesson | Definition and electronic configuration of transition metals |
| Instructional Objective | Using the portion of the periodic table provided, learners will correctly write the electron configurations of elements from Sc to Zn. |
| Plan for this Class  | In the classroom |
| Learning Materials  | Periodic table of elements, worksheets or books; projectors and/or chalkboard |
| References | 1) Ramsden. E.N (2000), 4th edition. A-level chemistry. Nelson thornes, UK , Syllabus S6,Notes from internet. |

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| Timing for each step | Description of teaching and learning activity | Generic competences and cross cutting issues to be addressed + a short explanation |
| In groups, using the portions of the periodic table provided on worksheets, and by answering different questions asked, learners will discuss and write the electronic configurations of the transition metals from Sc to Zn.  |
| Teacher’s activities | Learners’ activities |
| 1.Introduction 5 min | -Ask students to form groups of four students (Note: remember to put slow learners with quick learners).-Distribute worksheets with activities to be performed.-Ask questions from activity 1.1, question number one for revision.This has been done randomly. | -Form groups (4 members each) as requested by the teacher - follow teacher’s instructions- organize themselves in their respective groups- individually, try to answer the questions in Activity 1.1, question number one (revision):1. Write the electron configuration of the following atoms and ions:Ca (Z=11) (b) Ca 2+ (c) Na(Z=11), (d)Na+ Expected answers:a) 1s2 2s22p6 3s23p6 4s2b) 1s2 2s22p6 3s23p6c) 1s2 2s22p6 3s1d) 1s2 2s22p6 | Generic competencesCritical thinking: students have to analyse the questions critically in order to discover the electron configuration of Cr and CuCross cutting issuesEnvironmental sustainability:-During their mining, the space should be filled with soil again to avoid land sliding, development of mosquitoes which can cause malariaStandardisation culture: |
| 2.Development of the lesson |
| 2.1 Discovery activity 10 min | Let learners work collaboratively in their groups by answering questions provided in activity 1.1 | - Discuss, in groups of 4, on the questions provided in activity 1.1, questions 2 and 3 from the student book.2. Referring to the portion of periodic table in this book,Write the electron configuration of the elements from Sc to Zn.Point out any difference between the electron configuration of the above elements and that of other elements in s and p blocks 3. Define the term transition metal. | -Peace and values education -Cooperation , respect, love for others through discussions -Communication through social interaction-Caring while guiding learners-Attentive listening through group members’ discussion. |
| 2.2 Presentation of learner’s productionsin | -Invite 5 students from different groups to write the electron configuration of the provided substances (at the same time)-Note down some key words while students are presenting | -Write the electron configuration of the provided substances by the invited studentsExpected answers2.a)Related image b)

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| The electron configuration of main group elements | The electron configuration of transition elements |
| Their electrons end in s or p orbitals | Their electrons end in d orbitals |
| Have filled or no occupied d-orbitals | Have unfilled d-orbitals |

3. A transition metal is "an element whose atom has a partially filled d sub-shell, or which can give rise to cations with an incomplete d sub-shell". | cross cutting issues and competences to be addressed are the ones described above |
| 2.3 Exploitationmin | -Ask the students to comment on the answers given by their colleagues.-Judge students’ productions, corrects those which are false. | - Comment on the answer given by their fellow colleagues- Answer questions asked by the teacher-Write key points- Ask questions for clarification | Cross cutting issues and competences to be addressed are the ones described above. |
| 2.4.Conclusion/Summary5 min | - Guide learners in order to find the conclusion through questioning(why some elements have exceptional electron configurations) | -Find the conclusion guided by the teacherWhen building electronic structure of transition metals, 4s orbital is filled before 3d orbitals.The transition elements are stable when their d-orbitals are filled (d10) or when their d-orbitals are half filled (d5). This explains the electronic structure of copper, [Ar] 4s13d10 instead of [Ar] 4s23d9. The same applies for Cr: [Ar]4s13d5 and not [Ar]4s23d4.In order to attain that stability an electron can jump from 4s orbital to 3d orbital because those two orbitals are close in energy. | cross cutting issues and competences to be addressed are the ones described above |
| 3. Assessment5 min | Assess the achievement of instructional objective by giving varied exercises including those of ions of transition metals.Take care of slow learners as students mark each other.Inform the learners to make corrections during marking | - Learners work individuallyQuestions:Using Mn (Z = 25), Mg (Z = 12) and Br (Z = 35) as examples, explain the difference between the electron configuration of transition elements and that of main group elements.Expected answersMn: 1s22s22p63s23p64s23d5 ,Mg: 1s22s22p63s2Br: 1s22s22p63s23p64s23d104p5

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| transition metals | main group elements |
| -are found in d-block-are all metals | -are in s or p-block-some are metals others are non-metals |

 | Cross cutting issues and competences to be addressed are the ones described above |
| Observation on lesson delivery | The lesson took place very well where each student tried to participate during the exploitation process. One of the reasons is that the lesson attracts the interest of students from their prior knowledge on electronic configuration in senior four. |