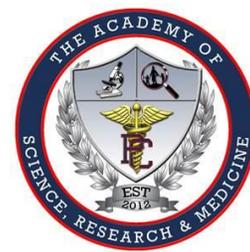# Periodic Puzzle Challenge Lab; SC4 a,b

Imagine the following scenario. As a student in the illustrious Academy of Science, Research and Medicine, you have chosen to volunteer over the summer as a lab assistant for a professor in a highly under budgeted chemistry department. Your first task is to finish a project started by the former assistant, who suffered an accident with cyclohexane while failing to observe proper safety procedures. The accident occurred while he was in the process of labeling and storing example specimens of each element in identical containers. Unfortunately, the labels on the 36 containers were either damaged or burned beyond recognition during the incident. To further complicate matters, much of the information contained in the assistant's notebook was damaged as well. This notebook contained practical facts about the elements' uses and traits, and data collected by other students. What did survive, however, were the etched serial numbers on each of the containers, which the assistant often referenced in the notes. Additionally, many exemplars of the unknown elements were created to help train new assistants, and while they clearly identify the elements, there are no references linking the exemplars to the etched labels. The professor and some of the students have assigned an alphabetic label (from **a** to **jj**) to each of the unknown elements and they have combined the remaining information with some of their own preliminary observations. Using these data, the exemplars and your own deductive reasoning skills, can you determine the identity of the 36 unknown elements? The purpose of this lab is to analyze and identify various elements by using an understanding of periodic properties and relationships. May the quest continue…

Procedure: The professor provided you with a list of the notes and observations based on the data from the damaged notebook. He has also provided you with element exemplars and a periodic table with the unknown elements omitted. Your task is to match the codes of the unknowns to the correct elements.

Table 1: The Unknown Elements (write the symbol for the elements a-jj)							
a		j		s		bb	
b		k		t		cc	
c		l		u		dd	
d		m		v		ee	
e		n		w		ff	
f		o		x		gg	
g		p		y		hh	
h		q		z		ii	
i		r		aa		jj	

Periodic Puzzle
Periodic Table of Elements

																		10 **Ne** 20.18
		21 **Sc** 44.96		**23** **V** 50.94				**27** **Co** 58.93	**28** **Ni** 58.69			**31** **Ga** 69.72		**33** **As** 74.92			**36** **Kr** 83.80
37 **Rb** 85.47		**39** **Y** 88.91	**40** **Zr** 91.22	**41** **Nb** 92.91	**42** **Mo** 95.94	**43** **Tc** 98	**44** **Ru** 101.1	**45** **Rh** 102.9	**46** **Pd** 106.4		**48** **Cd** 112.4			**52** **Te** 127.6	**53** **I** 126.9	**54** **Xe** 131.3
55 **Cs** 132.9	**56** **Ba** 137.3	**57** **La*** 138.9	**72** **Hf** 178.5	**73** **Ta** 180.9	**74** **W** 183.9	**75** **Re** 186.2	**76** **Os** 190.2	**77** **Ir** 192.2	**78** **Pt** 195.1		**80** **Hg** 200.6	**81** **Tl** 204.4			**84** **Po** 209	**85** **At** 210	**86** **Rn** 222
87 **Fr** 223	**88** **Ra** 226	**89** **Ac*** 227	**104** **Rf** 261	**105** **Db** 262	**106** **Sg** 263	**107** **Bh** 262	**108** **Hs** 265	**109** **Mt** 266	**110** **Ds** 271	**111** **Rg** 272	**112** **Uub** 277	**113** **Uut** 282	**114** **Uuq** 289	**115** **Uup** 288	**116** **Uuh** 292		

58 ***Ce** 140.1	**59** **Pr** 140.9	**60** **Nd** 144.2	**61** **Pm** 145	**62** **Sm** 150.4	**63** **Eu** 152.0	**64** **Gd** 157.3	**65** **Tb** 158.9	**66** **Dy** 162.5	**67** **Ho** 164.9	**68** **Er** 167.3	**69** **Tm** 168.9	**70** **Yb** 173.0	**71** **Lu** 175.0
90 ***Th** 232.0	**91** **Pa** 231	**92** **U** 238.0	**93** **Np** 238	**94** **Pu** 244	**95** **Am** 243	**96** **Cm** 247	**97** **Bk** 247	**98** **Cf** 251	**99** **Es** 252	**100** **Fm** 257	**101** **Md** 258	**102** **No** 259	**103** **Lr** 260

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