5. Conclusion

Previous research by Huang and Liu (2012) indicated that the students of low achievement in identifying chemical structural formulas always used the same strategies to identify 2D geometric figures and chemical structural formulas. The question of this study was that if the low achieving students used the same strategies to identify 2D figures and chemical structural formulas, what was the meaning of chemical element symbols to those students?

The behavioural data and the physiological data from N250 amplitude of ERPs indicated that chemical element symbols were meaningless for the students of low achievement in identifying chemical structural formulas. The physiological data from brain activities and interview data implied that those low achieving students ignored the chemical elements symbols when they identified the 2D chemical structural formulas in their cognitive processing because they had an alternative conception about ball and stick models of chemical bonding. They thought the 2D chemical structural formulas were the same as 2D figures. Based on the findings, this study suggested that science teachers must avoid only introducing the ball and stick models when teaching chemical structural formulas, and they need to emphasize the meaning of chemical element symbols through the use of multiple representations and analytical strategies.

References


