Assume you use calorimetry to calculate the specific heat capacity of a 125.24 g piece of unknown metal. You intially heat the metal to 100.0 °C in boiling water. You then drop the chunk of metal into a calorimeter containing 47.22 g of water at 19.7 °C. After closing and stiring the calorimeter thoroughly, the metal and water both come to equilibrium at a temperature of 27.6 °C.

**Part A**

What is the temperature change of the water?

Top of Form

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |

|  |  |
| --- | --- |
|  | 100.0 °C |
|  | 19.7 °C |
|  | 7.9 °C |

 |  |  |

Bottom of Form



**Part B**

What is the temperature change of the metal?

Top of Form

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |

|  |  |
| --- | --- |
|  | -72.4 °C |
|  | 125.2 °C |
|  | -27.6 °C |

 |  |  |

Bottom of Form



**Part C**

How much heat was gained by the water? (calculate the qwater)

Top of Form

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |

|  |  |
| --- | --- |
|  | 33.1 J |
|  | 1561 J |
|  | 418.4 J |

 |  |  |

Bottom of Form



**Part D**

Knowing the above, what must qmetal?

Top of Form

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |

|  |  |
| --- | --- |
|  | -33.1 J |
|  | -1561 J |
|  | -125240 J |

 |  |  |

Bottom of Form



**Part E**

Then what must the the Specific Heat of the metal be?

Top of Form

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |

|  |  |
| --- | --- |
|  | 0.4184 J/g°C |
|  | 25.00 J/g°C |
|  | 0.1721 J/g°C |

 |  |  |

Bottom of Form



