```
convertToAtomicUnitMom = UnitConvert[#, "PlanckConstant" / "BohrRadius"] &;
convertToAtomicUnitVel =
  UnitConvert[#, {"BohrRadius" * "HartreeEnergy"} / "PlanckConstant"] &;
```

```
eq1 = p_a + p_b == 0;
eq2 = p_a^2/(2 m_a) + p_b^2/(2 m_b) == e_k;
sol = Solve[eq1 ~And~ eq2, {p_a, p_b}] [[1]]
```

$$\left\{p_a \to -\frac{\sqrt{2}\ \sqrt{e_k}\ \sqrt{m_a}\ \sqrt{m_b}}{\sqrt{m_a + m_b}},\ p_b \to \frac{\sqrt{2}\ \sqrt{e_k}\ \sqrt{m_a}\ \sqrt{m_b}}{\sqrt{m_a + m_b}}\right\}$$

```
data = {e_k → 1.16 eV , m_a -> sodium ELEMENT [ atomic mass ],
    m_b -> chlorine ELEMENT [ atomic mass ]};
```

```
moms = {p_a, p_b} /. sol /. data
```

$$\left\{-5.68807\ \sqrt{u}\ \sqrt{eV}\ ,\ 5.68807\ \sqrt{u}\ \sqrt{eV}\right\}$$

```
convertToAtomicUnitMom[moms]
```

$$\left\{-7.40952\ h/a_0\ ,\ 7.40952\ h/a_0\right\}$$

```
vels = {p_a / m_a, p_b / m_b} /. sol /. data
```

$$\left\{-0.247418\ \sqrt{eV}/\sqrt{u}\ ,\ 0.160453\ \sqrt{eV}/\sqrt{u}\right\}$$

```
convertToAtomicUnitVel[vels]
```

$$\left\{\left\{-0.00697999\ a_0\ E_h/h\right\},\ \left\{0.00452661\ a_0\ E_h/h\right\}\right\}$$