

CHAPTER 9**HANDOUT****Composition of Urine****BLM 9.3.2**

The following table compares the composition of blood plasma, nephric filtrate, and urine. Study it carefully and answer the questions that follow.

Comparison of concentrations of substances in Plasma, Filtrate and Urine (mg/100mL)

Substance	Plasma	Filtrate	Urine	Concentration Change
Inorganic ions (all)	0.9	0.9	<0.9 – 3.6	<1 – 4×
K ⁺	0.02	0.02	0.15	7.5×
Amino acids	0.05	0.05	none	–
Proteins	8.0	none	none	–
Glucose	0.01	0.01	none	–
Urea	0.03	0.03	1.8	60×

Note: The pH of blood plasma and filtrate is 7.4. The pH of urine is 4.8–7.5.

1. Study the concentrations of the ions, the amino acids, glucose and urea. Why are their concentrations in the filtrate identical to those in the plasma?

2. Neither glucose nor proteins are present in urine, but for different reasons. Explain.

3. Although urea (a waste molecule) undergoes less reabsorption than glucose, its concentration in the urine has increased about 60-fold. Account for the increase.

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4. Give two reasons to explain why K^+ is more concentrated in the urine than in the filtrate.

5. Which ion accounts for the low pH of the urine? How and where is this ion transported into the urine? Why is the elimination of this ion important to survival?
