

Sulfonamide crystals may form and are associated with dehydration. Tyrosine, cystine, and sulfonamide crystals are found in acidic urine specimens. Calcium oxalate crystals may be found in acid, neutral, or alkaline urine specimens. The monohydrate form is associated with ethylene glycol toxicity.

The next step in identifying urine sediment crystals involves determining the solubility of the crystal in alkaline or acid. This information is summarized in Table 2-1.

Urine crystals will also have characteristic shapes and may have a characteristic color. This information is summarized below.

Types of Crystals

Amorphous Crystals

☉ Amorphous urates are found in acid urine. These crystals may appear pink on gross analysis and yellow microscopically (Figure 2-12). These crystals appear as granules in the urine sediment. Amorphous phosphates are found in alkaline urine. These granules are colorless microscopically and also appear granular when viewed microscopically. Occasionally amorphous material may appear in clumps or masses. It may be difficult to distinguish amorphous crystals from bacteria since they may be of the same size when viewed microscopically. However, amorphous crystals are soluble in opposing acid or alkaline solution; bacteria will not. Amorphous urates will also dissolve when heated.

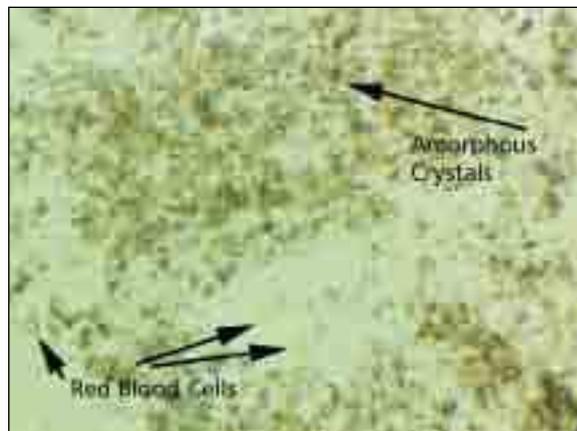


Figure 2-12
Amorphous crystals in dog urine sediment (40 X).

Uric Acid Crystals

Uric acid crystals are found in acid urine. These crystals are yellow or brown when viewed microscopically. These crystals appear as rhombic plates, rosettes, prisms, or are oval with pointed ends.

Calcium Oxalate Crystals

☉ Calcium oxalate crystals are found in acid, neutral, or alkaline urine. These crystals are colorless when viewed microscopically (Figure 2-13). There are two forms of the calcium oxalate crystal: the monohydrate and dihydrate form. The monohydrate calcium oxalate crystal is described as the “picket fence” form. These crystals are common in ethylene glycol toxicity. The dihydrate form is octahedral or “envelope” shaped.

Hippuric Acid Crystals

Hippuric acid crystals are found in acid, neutral, or slightly alkaline urine. These colorless crystals are prisms, plates, or needle-like in shape. These crystals are often conglomerated into masses.

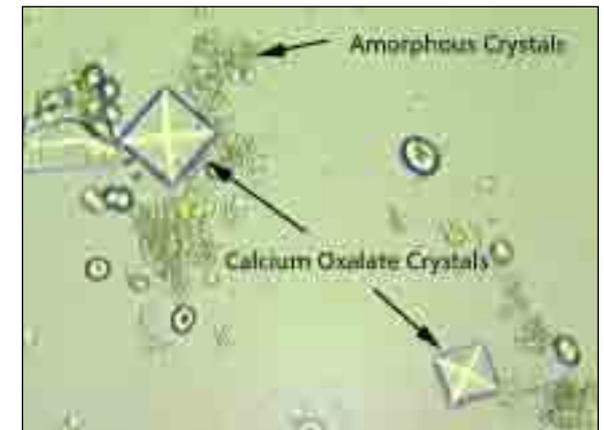


Figure 2-13 Calcium oxalate crystals in dog urine sediment (40 X).